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PERSONAL COMPUTING

JULY 1987 A Hayden/VNU Publication
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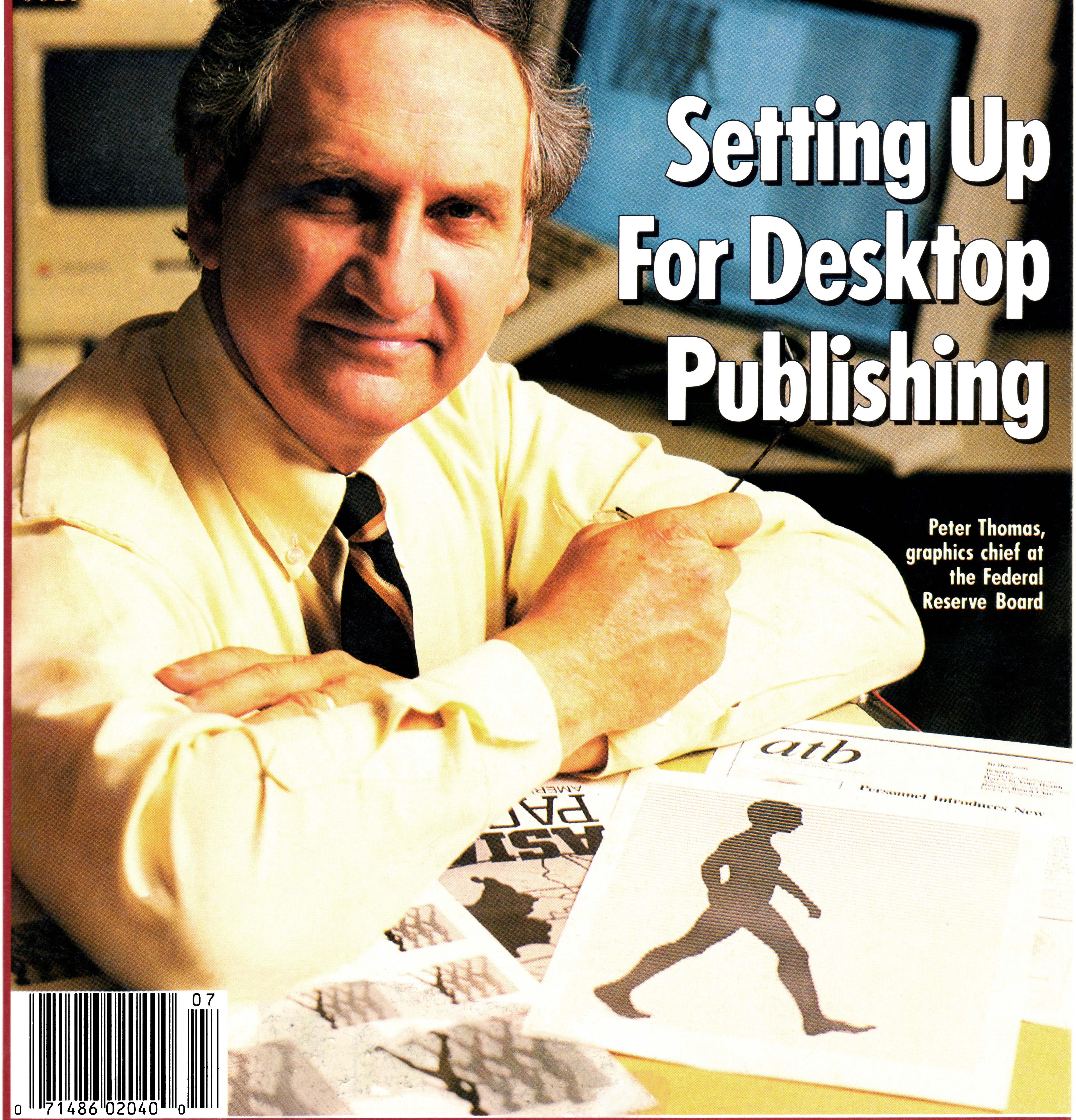

Setting Up For Desktop Publishing

Peter Thomas, graphics chief at the Federal Reserve Board

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Borland has to be a whole lot better because our competition is a whole lot bigger

At Borland we're competing with giants like Microsoft and Lotus, so we have to try harder. Out-think them, out-smart them, out-pace them, out-perform them—because we obviously can't out-spend them.

What that means to you—which is all that really matters—is that you now have access to the world's fastest compilers, because we were forced to invent them to compete with the giants. We may be smaller than they are, but we're absolutely, positively not slower than they are.

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Our technology is so advanced, it's easy to use

With Turbo Pascal® we invented fast compilers, and followed that technological breakthrough with Turbo Prolog®, then Turbo Basic®, then Turbo C.® Building these fast compilers is not an easy task. It was and is "the little guy" taking a giant step. And having transformed Languages with our new superfast compiler technology, we've turned the same power loose onto our Business products like SideKick® and Reflex®:The Database Manager.

> “ *SideKick continues to influence not only the utilities market but the entire software industry.*
>
> **William Urschel, PC World** ”

When Borland was founded 4 years ago, the software industry technology level was about C– on a scale of A to F. Which was and is a perfect opportunity for a technology-driven company like Borland. Call us "techies," but we're developers, technicians, tinkerers who know how to make programs run faster, do more, be more and let you fully use the hardware power you've paid for.

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Turbo Pascal: The worldwide standard

Pascal was asleep before we transformed it with a technical shot in the arm. Our unique ability to create spectacularly fast compilers was the driving force behind Turbo Pascal's worldwide success.

> “ *For the IBM PC, the benchmark Pascal compiler is undoubtedly Borland International's Turbo Pascal.*
>
> **Garry Ray, PC WEEK** ”

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We've raised BASIC from the dead with our recent high-speed Turbo Basic. Of course, Microsoft will try to sell you their "QuickBASIC," but we think you're interested in "fast," not "quick." Because we're a smaller company, we had to make Turbo Basic the "best BASIC development environment ever written." Otherwise, we'd be out of business. We try harder.

> “ *Borland International's Turbo Basic is unquestionably an outstanding software product.*
>
> **Giovanni Perrone, PC WEEK** ”

> “ *Turbo Basic is a compiled BASIC. This gives it execution speeds that leave standard interpretive BASICs like BASICA and GW BASIC in the dust.*
>
> **William Zachmann**
> **COMPUTERWORLD** ”

Turbo Prolog: The natural language of Artificial Intelligence

Turbo-charging Prolog was an enormous challenge. Creating a development environment on an ordinary PC that would rival those found on dedicated AI workstations like Sun and Apollo was deemed impossible. Enter Turbo Prolog. Exit the rest.

> “ *Turbo Prolog has one of the most powerful user interfaces ever seen in a software development system.*
>
> **Tom Swan**
> **Programmer's Journal** ”

> “ *If you're at all interested in artificial intelligence, databases, expert systems, or new ways of thinking about programming, by all means plunk down your $100 and buy a copy of Turbo Prolog.*
>
> **Bruce Webster, Byte** ”

Turbo C: Perhaps the most powerful professional development environment ever written

We've brought tomorrow's technology to Turbo C, which is so fast that it makes the rest look like dead Cs. We've given Turbo C a revolutionary user interface making it a wonderful productivity booster. And in keeping with our commitment to open architectures, we are even offering our users the opportunity to license the source code to Turbo C's runtime library.

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“ *Turbo C does look like What We've All Been Waiting For: a full-featured compiler that produces excellent code in an unbelievable hurry . . .*
. . . moves into a class all its own among full-featured C compilers . . .
. . . Turbo C is indeed for the serious developer . . . One heck of a buy—at any price.

Michael Abrash
Programmer's Journal ”

“ *Borland International's Turbo Pascal, Turbo Basic and Turbo Prolog automatically identify themselves, by virtue of their “Turbo” forenames, as superior language products with a common programming environment. The apellation also means, to many PC users, a “must have” language . . .*
. . .To us, Turbo C looks like a coup for Borland.

Garry Ray, PC Week ”

Reflex: The Database Manager

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“ *Reflex actually improves on 1-2-3 in several respects.*

William Casey, PC Tech Journal ”

“ *Reflex and Reflex Workshop may be the best bargain in software today. Highly recommended.*

Jerry Pournelle, Byte ”

Eureka™: The equation solver for Scientists, Engineers, Students and Professionals

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“ *Eureka is fast, and simple to use.*

Michael Miller, InfoWorld ”

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Word Processors? There are a lot of good ones around. WordPerfect™, WordStar® 4.0, and MicroSoft® Word are good products. But to compete, we had to build a better product. And using some of the technology we pioneered in our fast compilers, we set out to build the best professional word processor ever written.

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“ *Sprint: The Word Processor is a many-splendored package.*

Ken Greenberg, PC World ”

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July 1987 *Volume 11 Number 7*

PERSONAL COMPUTING

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COVER STORY

Setting Up For Desktop Publishing 74

Desktop publishing hardware and software have arrived, but implementing a system may befuddle even those with the best intentions for increasing productivity. Business professionals who have been there give you the benefit of their collective experience for the quickest route to newsletter nirvana.

HANDS-ON

The Output Side Of Data Bases 89

Getting information out of your data base software program can be tricky and as tedious as getting your data in, unless you know the acquired techniques to producing fast and efficient data base reports.

MULTITASKING

Communicating In The Background 100

Personal computer users are constantly grappling with the need to intelligently integrate communications into their daily routines. Now going on-line no longer demands disrupting your work flow. RAM-resident communications software lets you keep in touch as you recalculate that spreadsheet, sort those data base records, or graph year-end sales figures.

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Secrets To Mail Order Success 109

Mail order buying often means better-than-fire-sale prices for hardware and software products. But there's more involved than dialing a toll-free number and reciting your credit card number. Here are some savvy tips for getting the most out of mail order with the fewest problems possible.

Hard Disks: When Bigger Is Better 118

The allure of 200Mb hard disks has attracted many, but mega-storage drives present unique advantages and disadvantages. Knowing where they fit into your business can help you make maximum use of these "bottomless pits."

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Computing can be fun—at home or in the office—if you're willing to try the latest in leisure software.

BUYERS GUIDE

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Everything people on the go need to know about the expanding field of IBM-compatible portable and transportable computers.

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COVER: *Photograph by Maria Robledo.*

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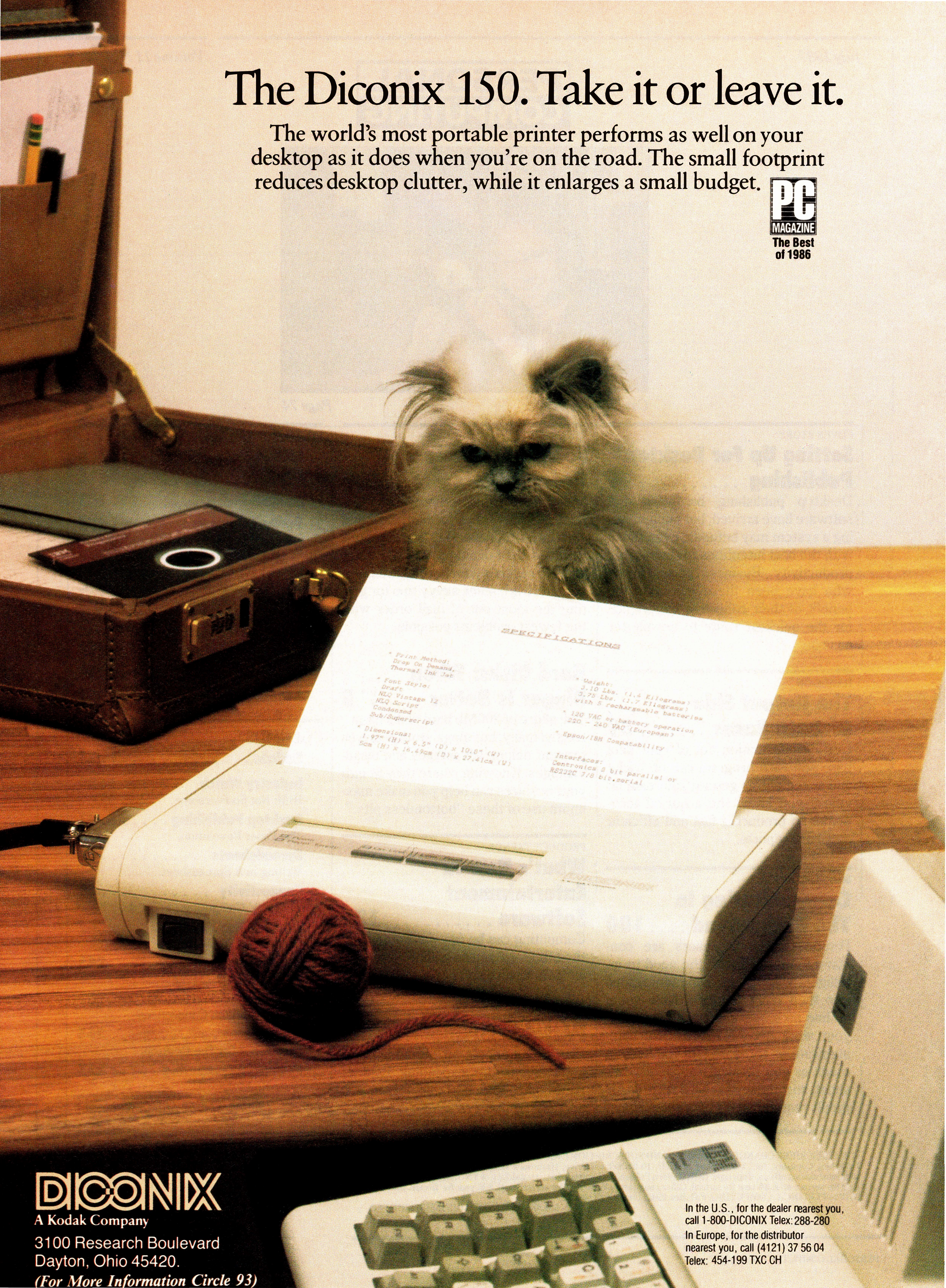

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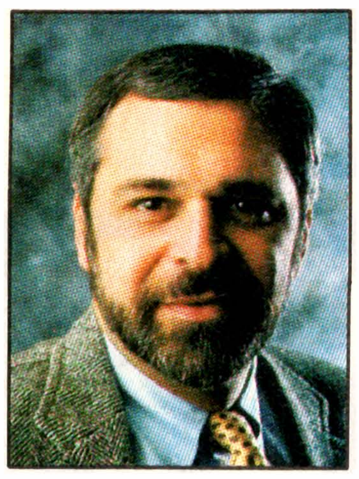
EDITOR'S NOTE

Computers With Mobility



Small and powerful. That's the signature of today's portable computers. After many years of trying to find the right formula, a score or so of manufacturers seem to have finally come up with movable feasts of computing—a collection of standardized, IBM-compatible machines that complement their desktop counterparts.

You'll hear a lot about these transportables and laptops as the compact and lightweight desktop machines of the future. Maybe. Right now, a need exists among a relatively small but hard-core group of mobile computer users for machines that can go along on business trips, or go home after hours and on weekends. And portable computers are fitting in as important elements of a company's computing strategy—whether for traveling sales reps or for special-purpose applications that put communications and computing power at remote sites.

Until now, the convenience of portable computing has meant compromise in the systems' functionality and utility. Recently, however, portable makers have bought into the MS-DOS standard. Software availability and data transfer pathways to the 3.5-inch disk drive have improved, and speed, storage capacity, and battery life have dramatically increased. Displays, too, a concern for any computer user, are more readable, although limitless room for improvement remains.

Some irksome details indicate that manufacturers still aren't really sure about the needs of portable computer users. For example, it is inexcusable for a portable to come without a carrying handle, and yet we continue to see such designs. Still, we offer you this month's buyers guide confident that today more than ever, you have a legion of functional choice in take-along computers.

Also this month, Managing Editor John Blackford offers a technical assessment of IBM's new PS/2 line. John talked with the designers and early users of the PS/2 line, and he has been deep in a hands-on investigation of these machines since their debut. In his inaugural Technology column, he points out some of the technical reasons these computers are hard to ignore—now and in the future.

You'll find much more in this issue that is new and—we feel confident—in tune with the times. But for a moment, I'd like to blow a horn for the past achievements of the magazine's writers and editors. Recently, *Personal Computing* was honored by the American Society of Magazine Editors for the 1987 National Magazine Awards. These are the "Oscars" of the magazine publishing field and in the last three years, *Personal Computing* has been cited with four nominations. We're the only magazine in our field to have been so honored. This year, our publication was one of five finalists in the Single Topic Issue category—for last year's Computing In America issue (October)—and in the General Excellence category for magazines with circulations of between 400,000 and 1 million.

To be so honored by our peers is flattering. The credit belongs to a hard-working, dedicated staff. In the judges' opinion, *Personal Computing* is a magazine that values communication and service and that takes its subject seriously—but not ourselves. That's the reason we were nominated. And that is the prize we're proudest of providing.

FRED ABATEMARCO, EDITOR-IN-CHIEF

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- ☐ **LANGUAGE 7**—Complete Pascal interpreter/compiler. Great for learning Pascal!
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- [2] **COMM 2a,b**—(2 disks) Procomm 2.42, an excellent modem program with terminal emulation.
- ☐ **EDUCATION 2**—Learn the Presidents, States (and capitals) and more. Color required.
- ☐ **EDUCATION 5**—Learn Origami, the Japanese art of paper folding. Color required.
- [2] **FINANCES 3a,b**—(2 disks) Express Calc 3.12, a powerful spreadsheet program.
- ☐ **GAMES 8**—Striker helicopter attack, and Risk, world domination. Color required.
- ☐ **GAMES 9**—EGARisk, the game of world domination in very high resolution. EGA required.
- ☐ **GAMES 10**—Solitaire, Teed-Off golfing, and Sailing in the Bermuda triangle. Color required.
- ☐ **GAMES 12**—MyChess (9 levels), Backgammon, and Wheel of Fortune. Color not required.
- ☐ **GRAPHICS 1**—Record and play back screen images! Excellent for demo, etc. Color required.
- [2] **INFO 2a,b**—(2 disks) Zip-Phone, national areacode/ prefix to zip-code cross reference.
- [2] **LANGUAGE 3a,b**—(2 disks) The A86 2.18 macro assembler and debugger.
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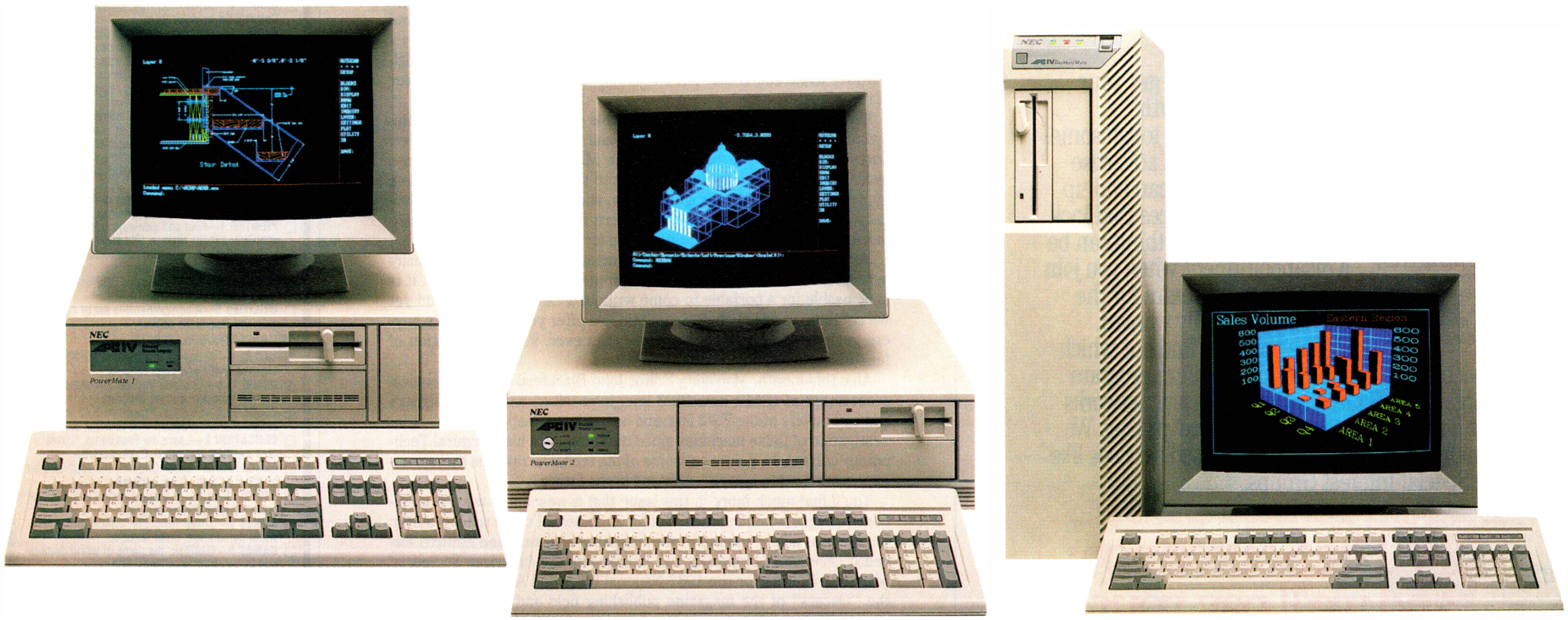

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(For More Information Circle 113)

How to choose an online service

Online services make your PC come alive. But before you settle on one, here are some helpful tips.

1 What are you going to need it for?

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2 What will it cost to learn?

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3 Check out the customer support staff.

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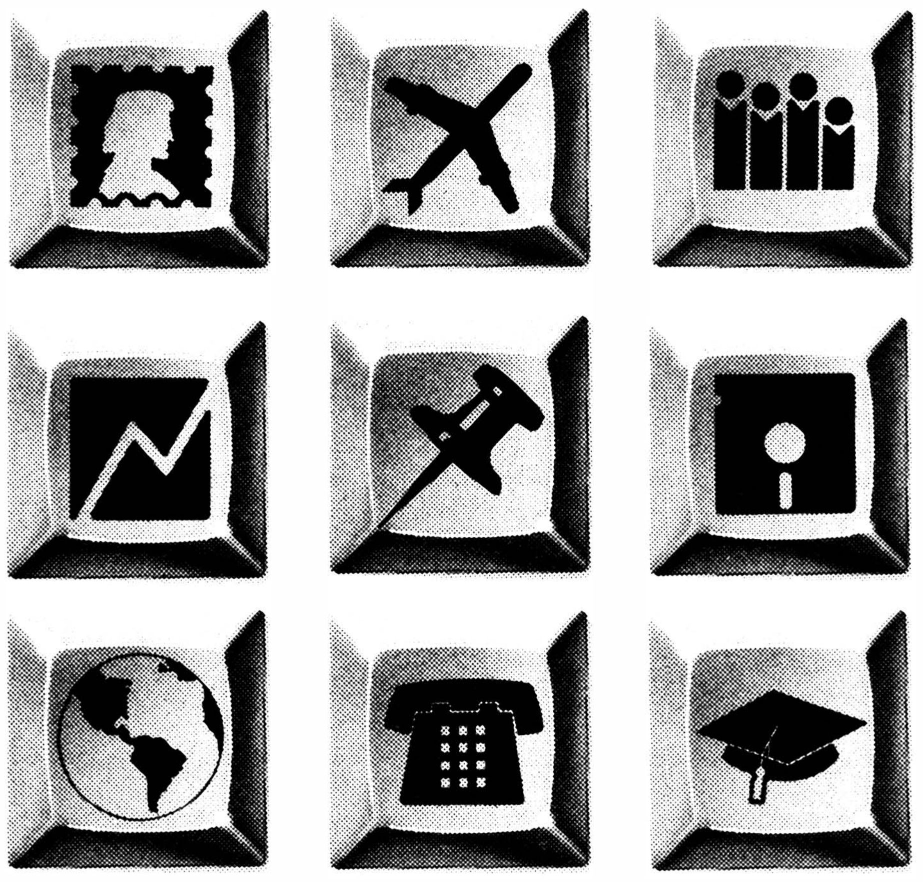

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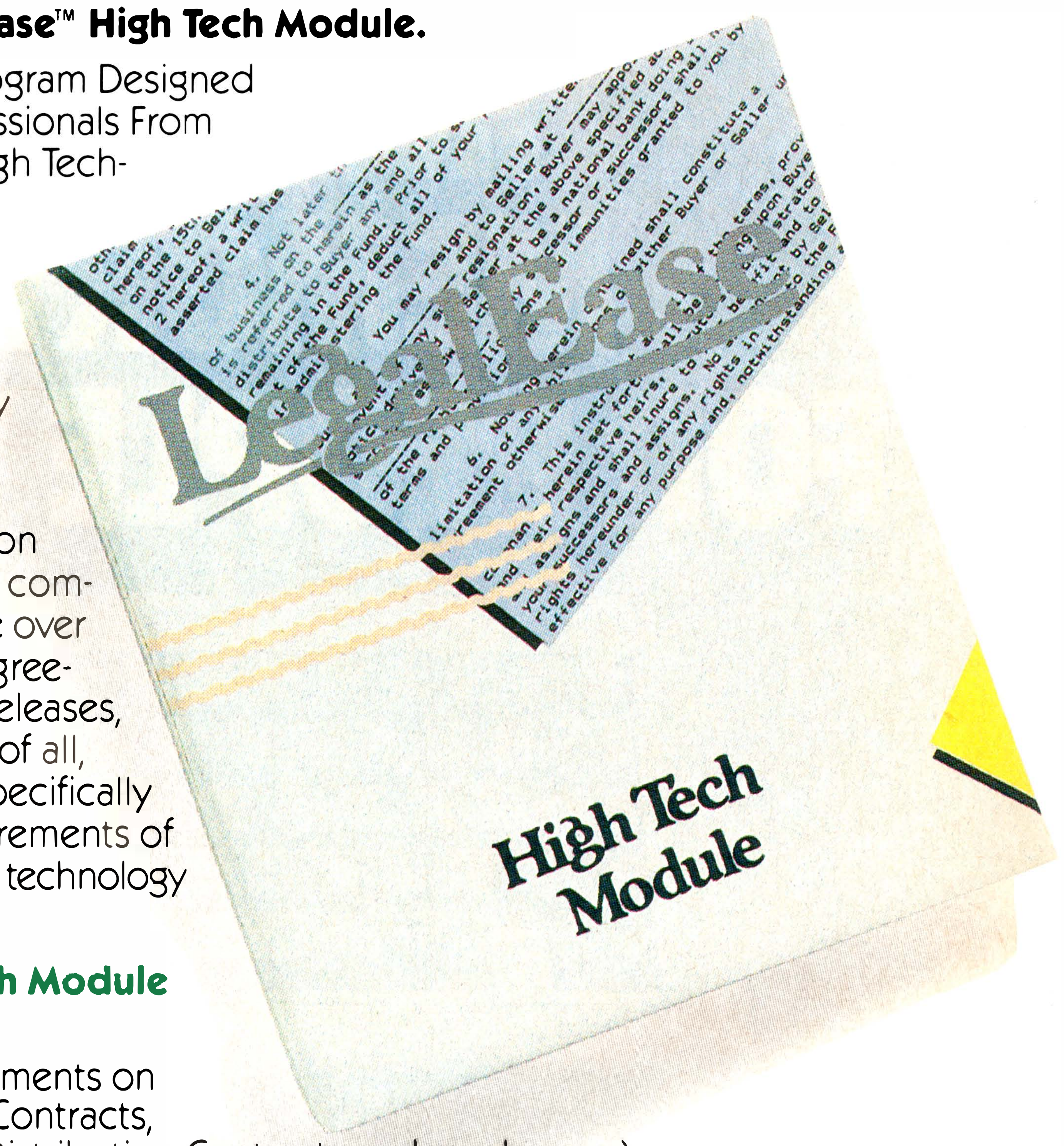

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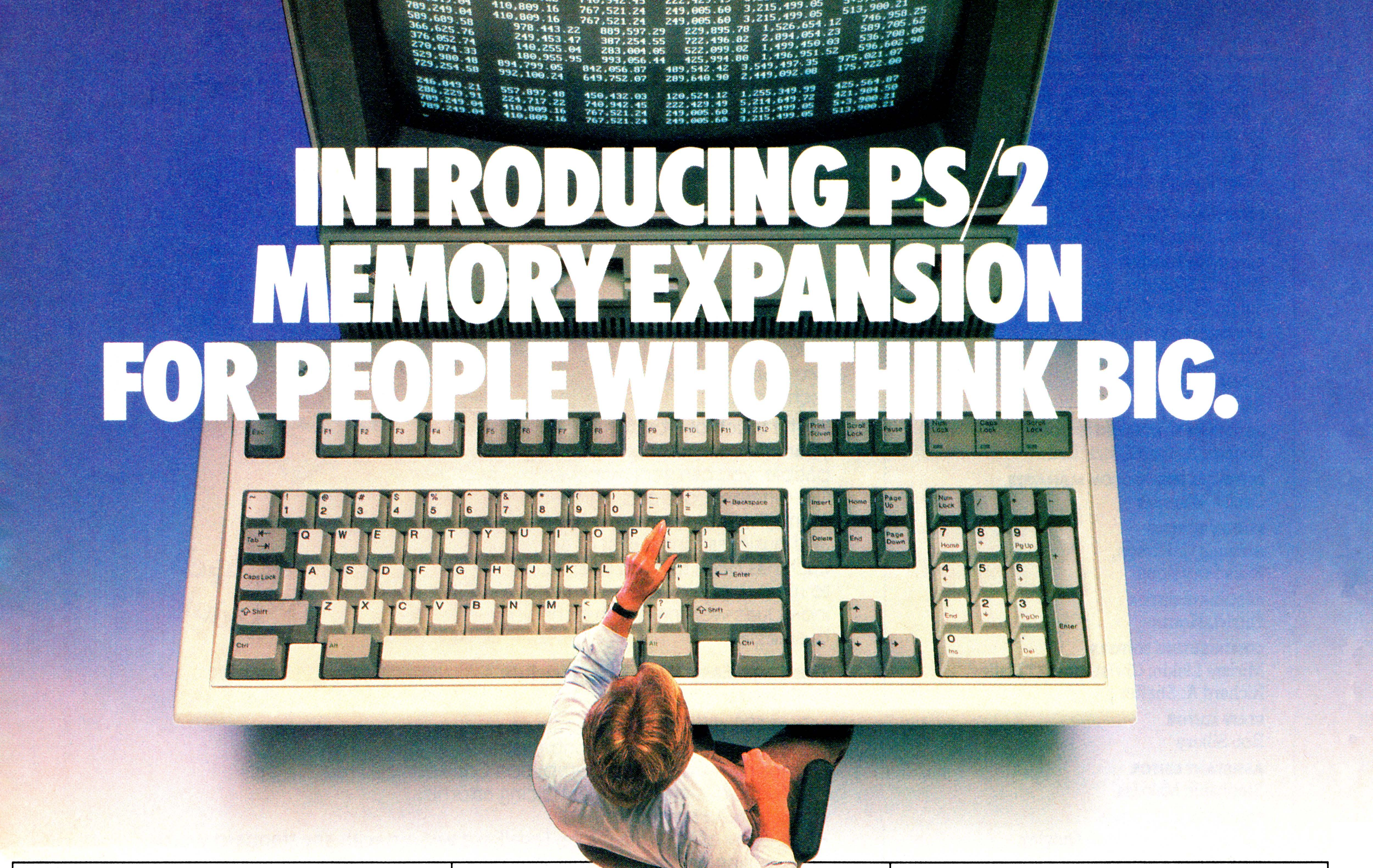

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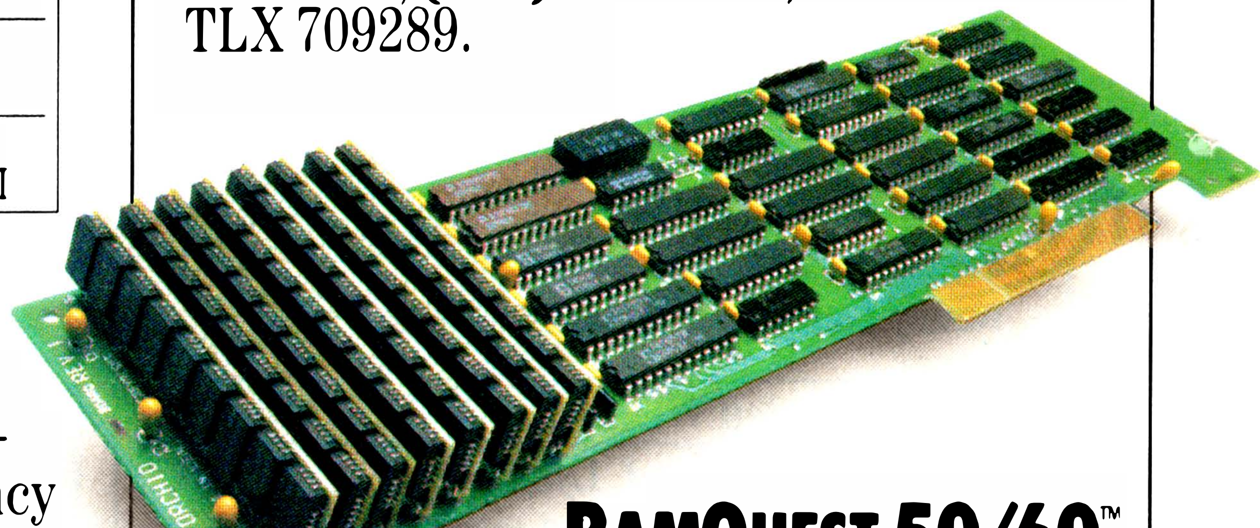

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LETTERS

IBM COMPATIBLES

Thanks and a tip of the hat to you for publishing the "Complete Guide To PC Compatibles" (BUYERS GUIDE, April). Since I am in the process of searching for a new AT clone, I found the information both timely and to the point. I am in the market for a 10MHz, zero wait state machine. Through your article, I was able to find 101 different AT clone models; there were 43 manufacturers of 10MHz machines. Unfortunately, not all of them supplied information regarding the availability of a zero wait state model or upgrade option.

Any list of the sort you attempted is bound to have a few omissions and inconsistencies. For example, there was no listing at all for the highly rated Multitech PC and AT clones. Likewise, the little-advertised Cranium 286 did not make the list. I'm sure there are probably dozens of mail order houses selling PC and AT clones under their own brand names that also failed to make the list. What did impress me was that so many of the smaller manufacturers were listed. In any event, your "Almost Complete Guide" has saved me hours. I had started compiling my own list on my current PC using my spreadsheet program. With your guide, I was able to get most of the same information without all the work.

Bill Volquardsen
Tempe, AZ

Your article, "Complete Guide To IBM Compatibles" (BUYERS GUIDE, April), did two of the three things a reader wants. It listed the competing companies offering IBM-compatible equipment, and it presented a checklist for evaluating the competing brands. I wish that the article had taken a position on some of the machines.

Bill Ibbs
Champaign, IL

SOFTWARE PIRACY

Although your article on software piracy (SPECIAL REPORT, May) made a lot of good points, it neglected a number of issues and misrepresented several facts.

Copy protection is in and of itself immoral and unethical. Disks on which often very expensive software is distributed are at best secure media for a limited amount of time. With age every disk will fail. The attitude of many software publishers is that they will provide the customer with one authorized backup disk in case the original master fails. What if the second disk should fail too? Indeed, software publishers are very willing to provide additional copies after they have received the original master, and with an outrageous "media and handling charge" that would make a loanshark blush in embarrassment.

Is it a big surprise, then, if software buyers insist on being able to make duplicate copies of their legitimate software?

You made a false and highly insulting claim when you stated that users' groups hold "swap meets" for the purpose of trading in pirated software. Although I do not claim that no copyright violations occur during swap meets in any users group, the vast majority of serious users groups ensure that the software that is swapped is from the public domain, is shareware, or that the author has given

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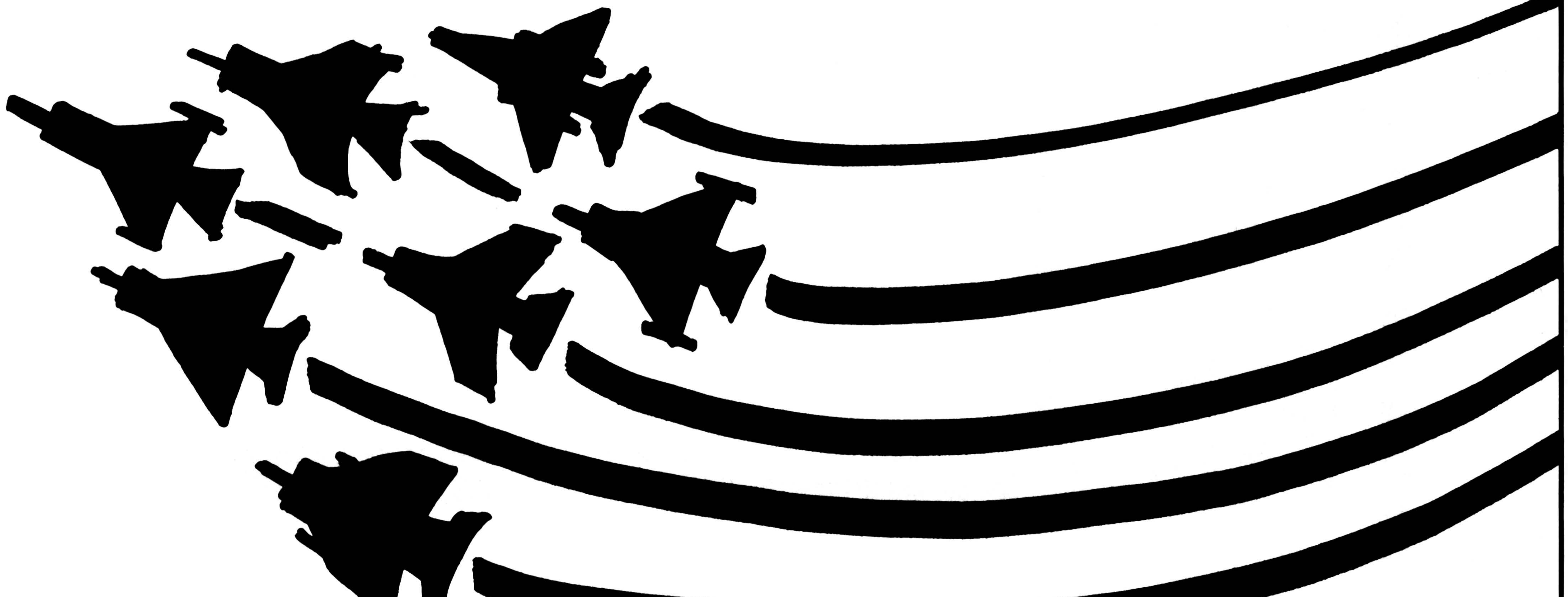

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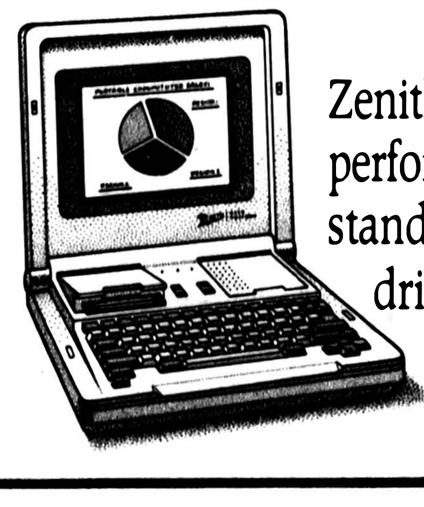


permission for the software to be copied. The self-righteous accountant in your article not surprisingly waited until he was at home before he challenged the honesty of the people who had given him the software to copy. Reformatting the disk also ensured that his claims could never be challenged by proving that the software was, in fact, in the public domain. A straightforward question during the swap meet might have been more appropriate.

I am a data processing consultant to industry and I would also like to object strenuously to the statement in your article that many consultants are thieves. Although I am sure that there are consultants who do steal software, I doubt sincerely that they make up a higher percentage in their profession than do doctors, lawyers, or software authors who steal.

F. McGregory
El Paso, TX

ACTION

Your recent article on software piracy (SPECIAL REPORT, May) made me realize that a lot of my software was really stolen property. After reading it, I reformatted more than 20 disks containing unauthorized copies of popular software. Most of it was software I rarely used, but there were a few things I was reluctant to part with.

Chip Burkitt
Lincoln, NE

SHEDDING THE BIG BLUE BLANKET

I would like to congratulate you on an outstanding report concerning the 386 processor and DOS 5.0 ("Hard Questions And Not-So-Easy Answers," SPECIAL REPORT, March). I can see now that we, as computer users, have taken a substantial first step away from an IBM standard to a more hardware-independent DOS standard. Users are no longer limited to the question, "Is it IBM compatible?" Now the question is, "Does it suit my application environment?"

I believe that users, after the initial shock of being relieved of their Big Blue security blanket, will readily accept this widening of their options. The users who you interviewed in the related stories were not concerned with what IBM will do, but if these 386 systems were right for them. I believe that more users will come to ask themselves these same questions.

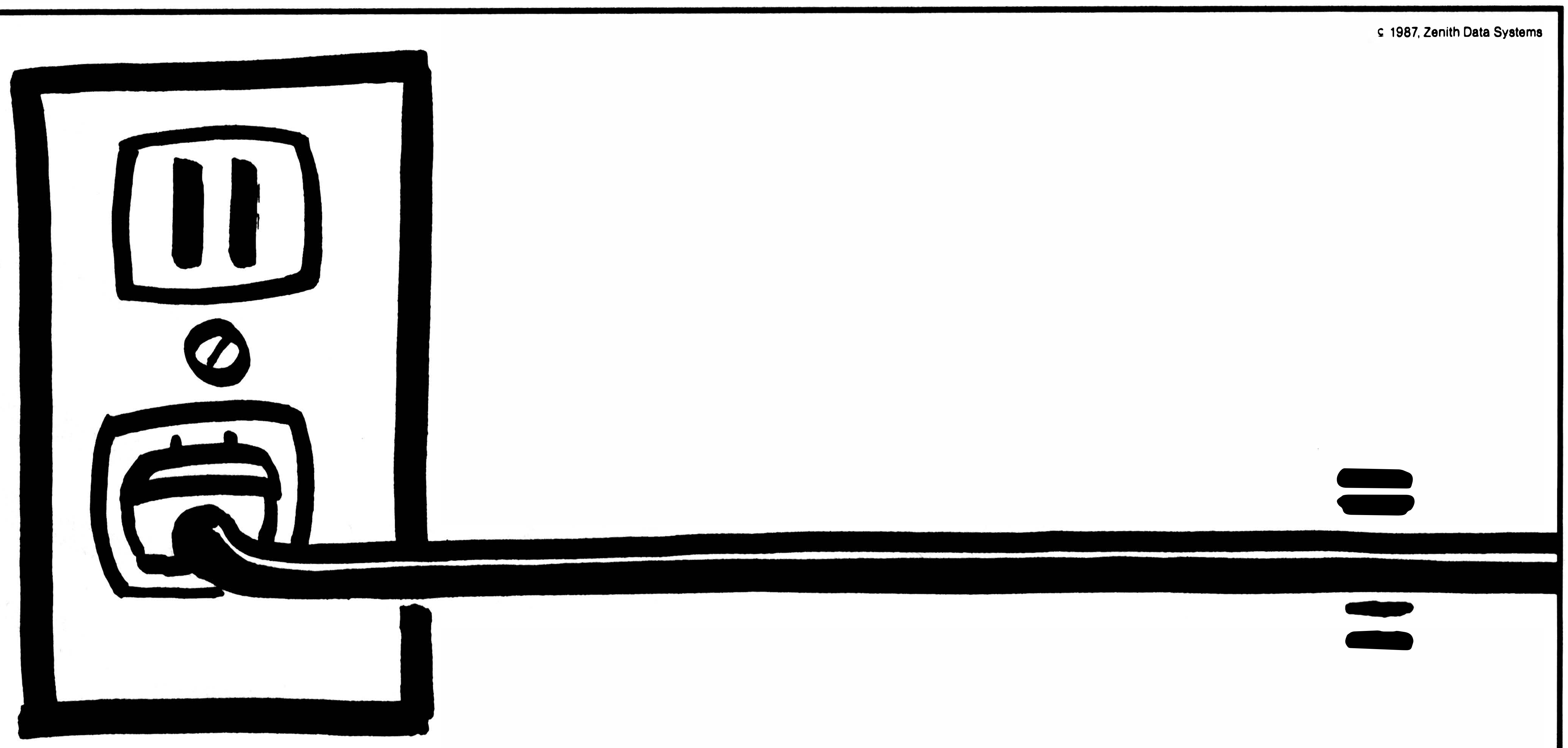
The 386 processor is being touted as useful only for power users, CAD/CAM, and in a network environment. Isn't this the same thing that was being said about the 286 systems when they were first introduced? Now that the 286 is the office standard, I believe it will only be a matter of time before the 386 systems replace them.

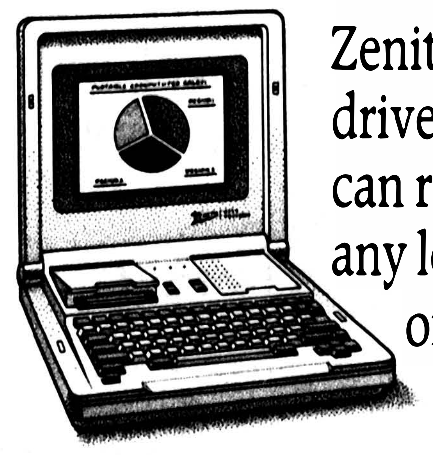
John C. Connor
Alabaster, AL

THE MAC IS BACK

As a Macintosh aficionado, I was excited to finally see the Macintosh presented ("The Mac Is Back," SPECIAL REPORT, April) as what it really is: a viable, serious business system and a direct assault on outdated and cryptic IBM personal computers. It is high time that was recognized.

I did find one error, however, in the otherwise fine articles. I don't think that the 81-key keyboard option has function





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keys on it, though it does have the numeric keypad.

I enjoyed the objective articles, and I was pleased that in other April articles (i.e., "What's New In Tax Software") at least one Macintosh software product has been listed. This is essential to dispel the myth that there is no Macintosh software out there.

IBM enthusiasts can continue to look the other way, but the fact remains Apple has offered more powerful business solutions for over a year now and it is only a matter of time before all computer users will choose to utilize the more powerful business machine: Macintosh.

Det Konnor
McLean, VA

PERFECT SURPRISE

Was it really fair, in the story "How Well Do You Spell?" (PERFORMANCE, March), to compare prices of standalone spelling checkers with full-blown word processors like WordPerfect?

You concluded the article by predicting the next standard feature in word processing to be an electronic thesaurus. Surprise, surprise. WordPerfect already includes a thesaurus, and macros, and many other features. All for one price.

Donnette. S. Smith
Idaho Falls, ID

BETTER, SMALLER, FASTER

The new family of IBM computers are designed to be competition crunchers. This time, IBM is going at it the right way—they are building better, smaller, faster hardware. Big as IBM is, they can learn from the competition. Let's hope that in this world of extramural and intramural communications, we will start to strive for compatibility and quality. We should aim for customer satisfaction first, last, and always.

Robert Hawkins
Santa Barbara, CA

PAGEMAKER FOR THE MAC

I enjoyed your article on desktop publishing, "Dueling Lasers" (PERFORMANCE, May), and was not surprised at your conclusion that the Macintosh system yielded better results in far less time than the corresponding AT system. I was dismayed, however, at your seeming unfamiliarity with the PageMaker package for the Macintosh.

You state on page 95 that "... PageMaker rigidly assumes that each page of the document should be uniform." You claim that once a column guide format is chosen, it cannot be changed on a page-by-page basis. This is not true. PageMaker allows two separate master page column formats, one for left-hand pages and one for right-hand pages, either of which may be overridden for a single page. To change the column format for a page, simply choose "Column Guides" from the Tools menu or drag a column guide with the mouse. The column formats of other pages remain intact.

Further, you claim that PageMaker is unable to vary page margins on a page-by-page basis. While this is a real restriction, it is easy to overcome. Simply define the document's margins to be the narrowest that will be found in the document. Later, by simply not placing text all the way to the margins, the effective margin may be increased. This may be facili-

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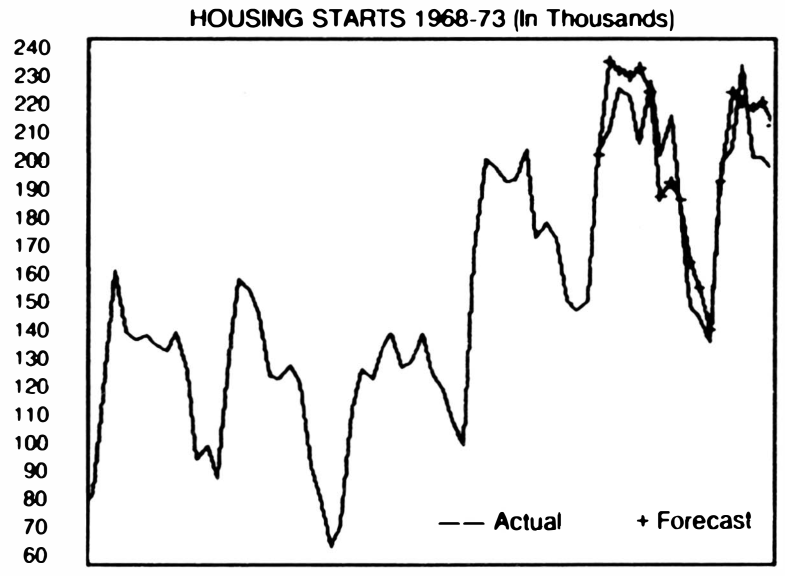

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2. An Installation Guide to lead you step by step through our simple installation procedure.
3. An Accounting Primer, written for Peachtree users by an industry expert, to explain accounting concepts.
4. Tutorials on each module with sample data to make learning easier.
5. A complete Reference Library with detailed instructions in plain English on all software functions.

Q. Is Peachtree Complete really the same product that used to sell for $600 per module?
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With more than 150,000 users to its credit, Peachtree Complete has been the PC World Class Winner in its category for two of the last three years.

Q. What's the difference between Peachtree Complete and the $69.95 systems?
A. Peachtree's system is called Complete because it contains the eight most needed accounting packages (including payroll) and all reference materials for one price. Remember, it was designed as a $4,800 accounting software system.

The $69.95 systems, on the other hand, are incomplete. They were designed to sell for $69.95 and require the purchase of additional modules to be comparable—payroll, $49.95 more; tutorials, $19.95 each; etc. Everything is a la carte.

Q. How soon will I outgrow the system?
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(For More Information Circle 191)

tated by adjusting column guides and placing ruler guides to define the area in which text and graphics are to be placed.

You also describe a problem you had in pasting part of a formatted Excel spreadsheet into the document. There is really a very simple way to accomplish this. If the user holds the shift key while pulling down the Edit menu, the copy command changes to Copy Picture. When this command is chosen, a copy of the selected area is placed on the clipboard in PICT format with all special cell formatting intact, just right for pasting in PageMaker. To omit the gridlines, simply uncheck the "Print Gridlines" option in the Page Setup dialog box. To hide the row and column headings, use PageMaker's cropping tool.

Patrick J. Kuras
Brighton, MA

TALKING DISKS

I read the braille version of *Personal Computing* each month and find it very informative. I applaud you for noting that there are blind and visually impaired users of personal computers who want to keep up with what's happening in the computer world. I wish that the manufacturers of software and hardware would follow your example by making their manuals available on floppy disk so that they would be accessible to *all* personal computer users.

By using my Tandy 1000, for instance, along with my Votrax Type 'N' Task (a speech synthesizer that reads the information appearing on the monitor), which is connected to an RS-232 port, along with Computer Conversations' The Enhanced PC Talking Program, version 3.5, I could peruse manuals that were on floppy disk without having to depend upon a sighted person to assist me.

Rebecca Totten
Columbus, OH

APPLES AND ORANGES

Bill Gates appears to have the "apples and oranges" disease ("On: A Platform For The Next 10 Years," COVER STORY, May); apples being software and software applications, and oranges being machines and hardware. I'm referring specifically to the section starting on page 81, "Mini and Mainframes Applications Don't Necessarily Point The Way." While this statement may very well be true, the elaboration that follows it contains symptoms of the affliction.

I work with computers all day long:

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(For More Information Circle 29)

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C&C Computers and Communications

NEC
NEC Information Systems, Inc.
(For More Information Circle 64)

DEC's VAX-11/780s, and IBM PCs and compatibles. While Gates is right to point out the fact that some mainframes are centered around data repositories, and that these applications make it difficult to get printed reports, the data repository application is just that, an application. It has no bearing on the limitations of the machine. The spectrum of possibilities for applications in the mainframe world is as unlimited as in the personal computing world. In fact, considering the limitations of MS-DOS, the apparent limitations of the proposed "New DOS," and the time it takes for applications development, minis have more right now. Proven word processors, data bases, graphics programs, and all manner of language compilers exist for mainframes and minis today. They are more powerful and more versatile than personal computers . . . right now.

Don't get me wrong. I'm quite impressed with personal computers and their potential, and I'm looking forward to spending lots of time with them. Let's just take a deep breath, and tell ourselves we know the difference between applications and the machines they run on. Besides, look around. All the top-of-the-line personal computers are beginning to look and act more and more like minis and mainframes every day. In addition to their increasingly smaller sizes, they're running faster, implementing more sophisticated instruction sets, and are becoming capable of addressing more and more memory. All personal computers need now is an operating system.

Charles G. Killie
Columbia Falls, ME

INTRODUCTORY OFFER

I was very excited when I saw the full page ad in your March 1987 issue touting the virtues of PFS:First Choice. My excitement doubled when I noticed the line at the bottom of the page which read: "Special Introductory Offer. Save $50, limited time only." My excitement, however, diminished when I phoned two different software dealers here in Los Angeles who knew nothing about this offer. Anxious to get the straight scoop, I called the sales department of Software Publishing Corp. who distributes this product. They told me that the "save $50 introductory offer" consisted of their releasing the product at an introductory price of $149 with the intention of later raising the retail to $199, hence the $50 savings. However, following reflection and market research, they realized that $179 was a better price for the product.

While I applaud any software company that makes decisions that result in lower prices, I still find it hard to swallow an ad that offers a $50 savings when in fact the saving is only $30.

Rick Mandl
Los Angeles, CA

Brian Hueckroth, who is the product manager for PFS:First Choice, responds: The PFS:First Choice program was originally priced at $199, suggested retail. As part of the product's introduction, Software Publishing Corp. offered the product at $149, suggested retail, which is $50 less than our original price.

SPC reserves the right to adjust our prices based upon the market, when such action is warranted, just as any company would. In this case, the price was adjusted to $179, suggested retail, where it now resides.

SPC regrets any misunderstandings caused by the introductory offer. We hope that our customers agree that First Choice is an exceptional value for the price, especially at $179.

A THIRD PATH

Richard Shaffer ("The Software Imitators," INDUSTRY WATCH, March) speculated that the software industry would split along two paths: "the high road, purchasing original software to get the updates, warranty, manuals, add-ons, and other benefits" and "the low road, buying clone software. . . ." His argument seems to hinge on the fact that the high-priced originals are "reliable, trusted, and well-distributed" whereas the software clones are not.

Shaffer has overlooked another important alternative to ultra-high-end software: inexpensive software from recognized software firms such as Spinnaker, Broderbund, or Timeworks. We offer quality, original productivity software at excellent prices. And because of who we are, our products are "reliable, trusted, and well-distributed". And yes, updates, warranties, and manuals all come for the one low price. For example, this summer Spinnaker will ship Betterworking Seven-In-One, which includes a spreadsheet with 1-2-3 import and export, a data base manager that is Dbase III compatible, a word processor, integrated outlining, a 100,000-word spelling checker/corrector, a desktop, and a complete communications package. The retail price: $59.95.

Shaffer seems to believe that keystroke for keystroke compatibility is a

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(For More Information Circle 178)

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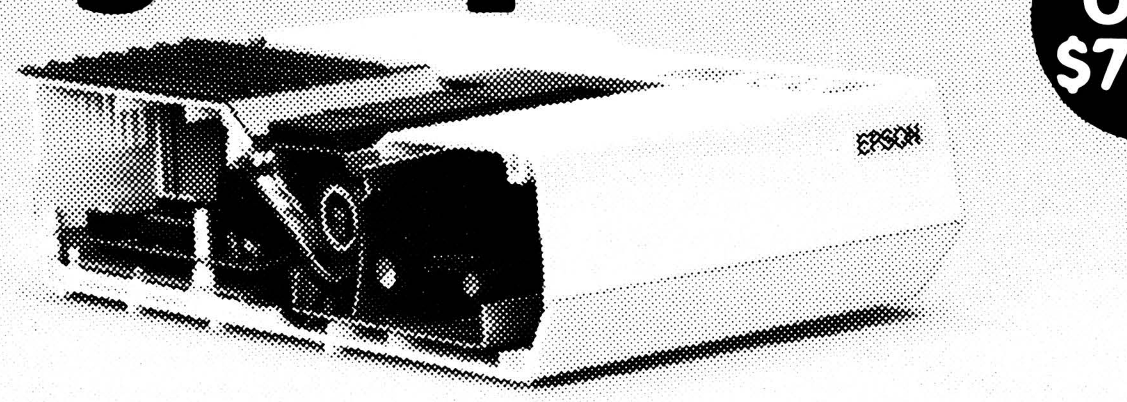

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LETTERS

highly desirable feature in productivity applications. He believes this so much that he conveniently brushes aside the fact that it is currently illegal to offer it. Admittedly, keystroke for keystroke compatibility is not part of the package when one buys an inexpensive, quality program. But well-designed software is so easy to learn this may not be important. The absence of keystroke-level compatibility between 1-2-3 and VisiCalc never seemed to hurt 1-2-3 much.

I share Shaffer's concern about the high price of industry- standard software and also wonder how the flood of new value- sensitive consumers will react. Perhaps these new consumers will turn, not to the unknown software clone companies, but rather to the alternative product that is quality, original, and inexpensive, from trusted companies like Spinnaker and its friendly competitors.

C. David Seuss
President
Spinnaker Software
Cambridge, MA

ASK THE LIBRARIAN

As a librarian, I must comment on your article "Building A Data Base" (PERFORMANCE, November). In this article, you say "a librarian may not be familiar with the data and, therefore, cannot perform as thorough a search as could someone who knows exactly what is relevant."

If a corporation has set up its corporate library in the correct and proper way, the librarian would know more about the data needed, and where to find that data, than most managers.

H. James Rader
Dover, AR

ENTER MENTOR

Your article, "How many Ways Can You Say Thesaurus?" (PRODUCTIVITY, May) was so interesting that I called MacLightning's developer to find out if it worked with Microsoft Word 3.0. The article noted that it did work with most Mac programs. To my surprise, MacLightning will not work with 3.0, but there is a program coming out June 1st that will; it is called Mentor.

William R. Harvey, Sr.
Springfield, VA

Editor: Mentor will be available for $99.95 from Target Software, 14206 S.W. 136th St., Miami, FL 33186; (800) 622-5483, (305) 252-0892.

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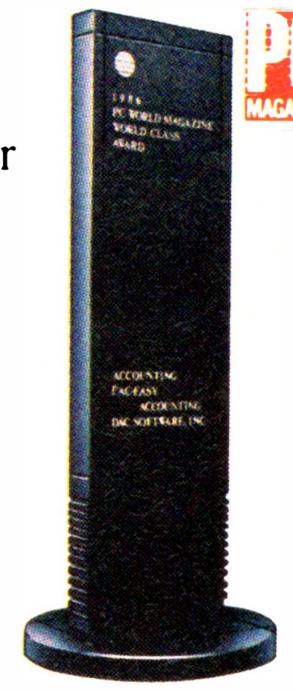

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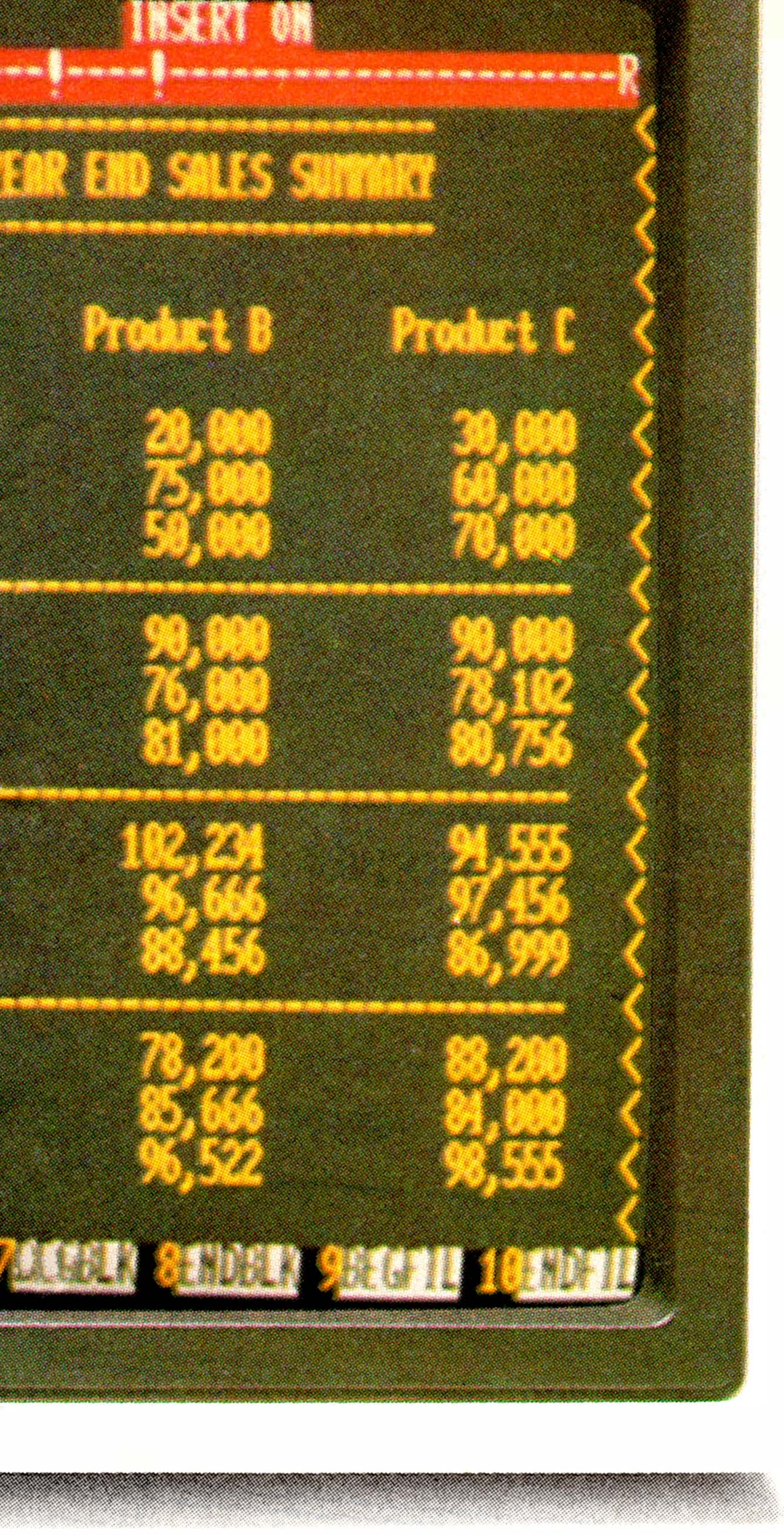

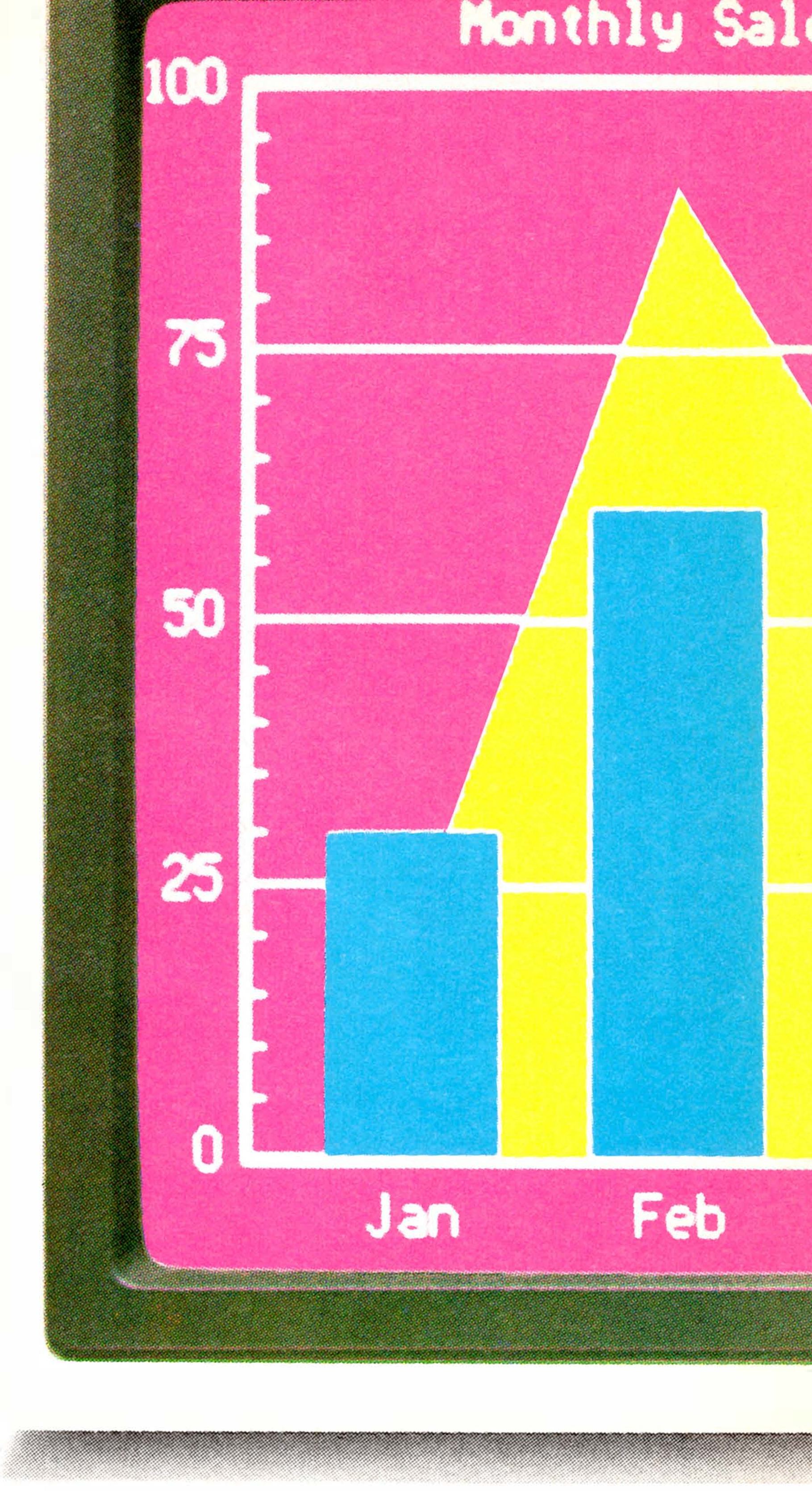

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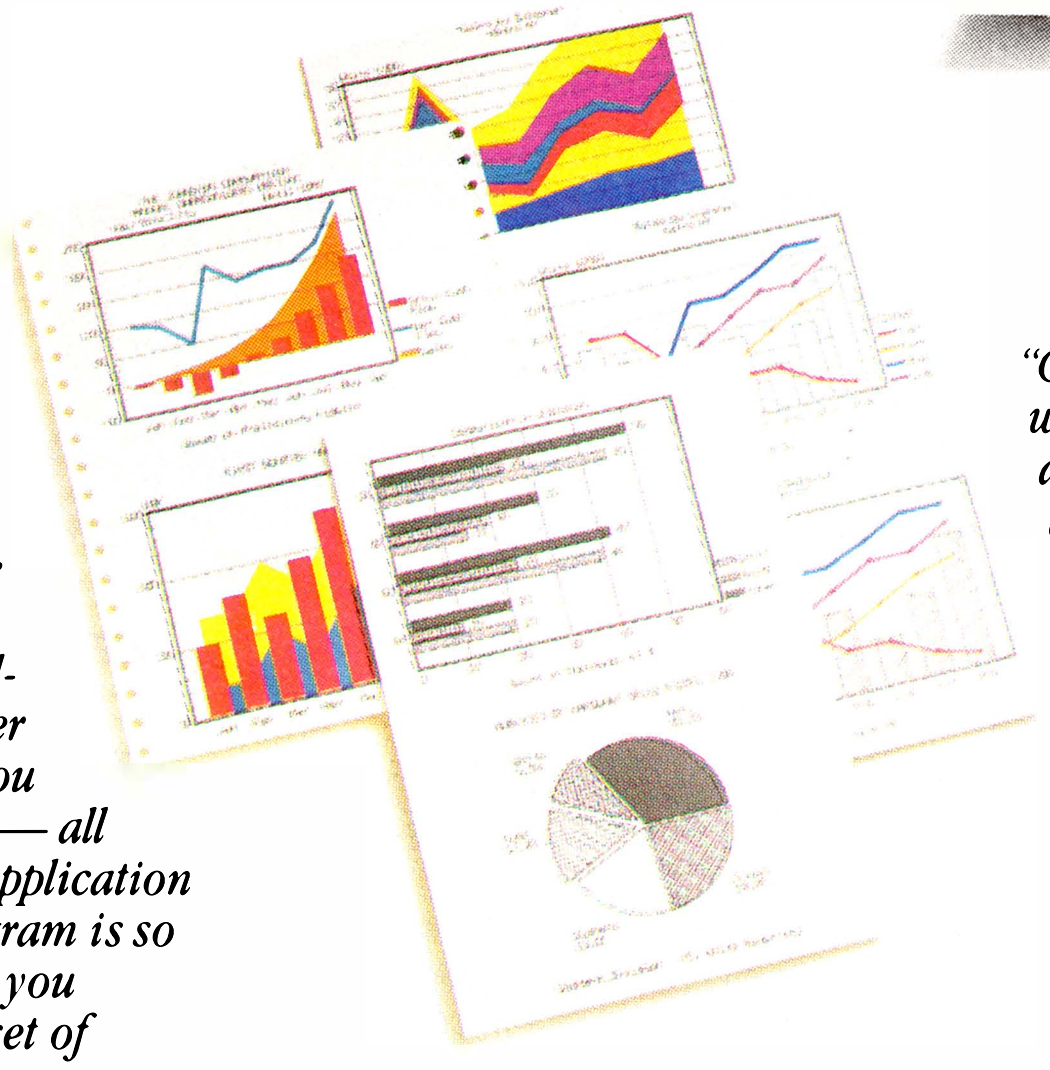

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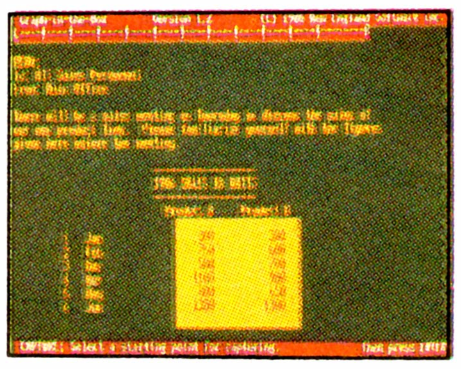
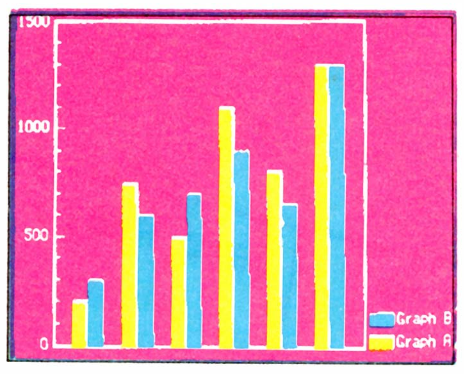


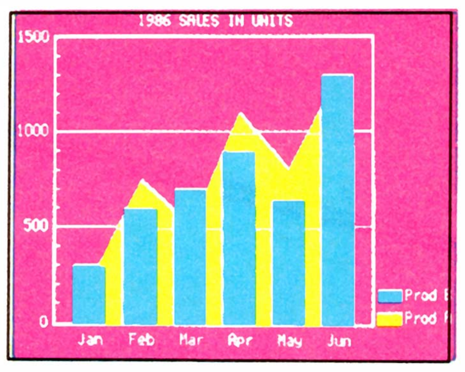
One keystroke wakes up Graph-in-the-Box during any other application. Just pass the cursor over any numbers to "capture" them from the screen...



2

and press ENTER to see them displayed as a simple column graph.

3



Capture text for labels the same way. Then you can view the finished graph in eleven different formats (line, pie, etc.) at the touch of a key. Display, save, and print Instant Graphs in just seconds.

"Graph-in-the-Box is a serious business tool. With it you can quickly turn a table of numbers into a graph, regardless of whether the numbers reside in a word processing file, spreadsheet, data base, or any other application program. And you can save or print the graph — all without exiting your main application ...But watch out — the program is so much fun to work with that you might start graphing every set of numbers in sight." **PERSONAL COMPUTING**

"Graph-in-the-Box is one of the neatest ideas I've seen for a memory-resident program. In its way Graph-in-the-Box is like Borland's Sidekick. It gives you a common function — in this case, presentation graphics — right at your fingertips." **INFOWORLD**

"This is a no-nonsense program that transforms data displayed by any program, memory-resident utilities included, into a compelling repertoire of business graphs. You can, for instance, quickly create graphs to accompany a word processed business plan, generate charts from data in a graphless spreadsheet program such as Multiplan, or analyze data on the spot during an on-line session. Works uncomplainingly with 1-2-3, SuperCalc 3, dBase III, pfs:file, Symphony, WordStar, and DisplayWrite 3, as well as with SideKick, Pop-Up DeskSet, and Turbo Lightning...For quickly analyzing a realm of data or creating compelling graphics, Graph-in-the-Box is an enticing option." **PC WORLD**

"This dream can become a reality with Graph-in-the-Box." **PC PRODUCTS**

"Just the ticket...can't be beat...easier to use than almost any other graphics software." **PC MAGAZINE**

"Very easy to use...It gives you advanced capabilities as well as ease of use." **THE COMPUTER SHOW/FNN**

"Graph-in-the-Box is a new, exciting, welcome approach to chartmaking. It does exactly what it claims to do, and does it well...The program's versatility in capturing data from other application programs, ease-of-use, practicality, excellent manual and low cost earn it an extra-high rating." **COMPUTERS IN ACCOUNTING**

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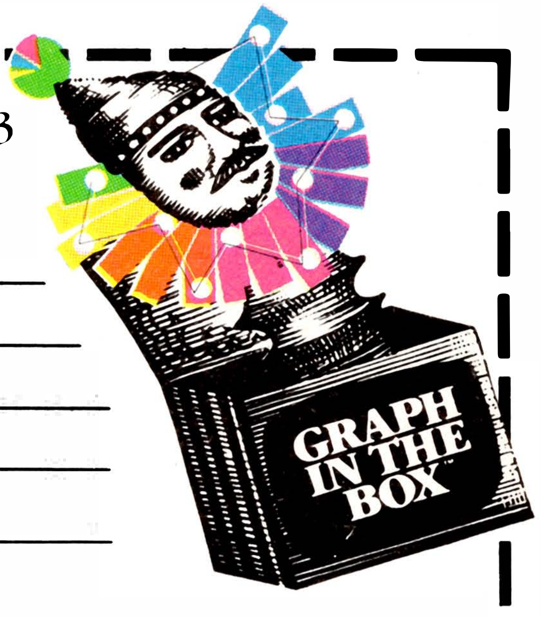

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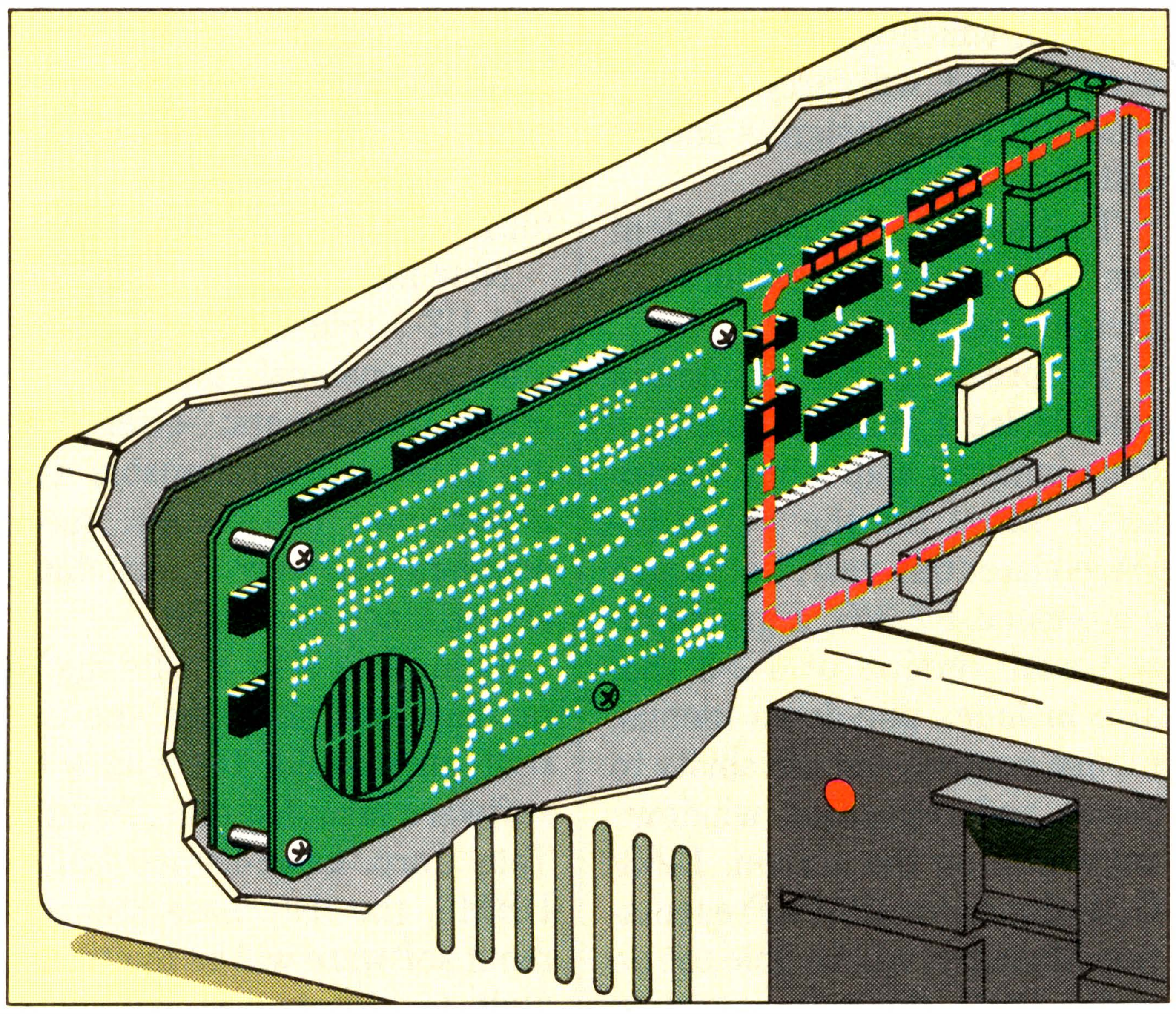
UPDATE

JULY 1987

Modems Operandi

▶ Speed, several new features, and evolving telecommunications technology are at the heart of the latest generation of modems from Hayes Microcomputer Products, Inc., Norcross, Ga. The company introduced four modems that incorporate new error-control, data compression, and "automatic feature negotiation" schemes to boost communications throughput. Hayes also unveiled the Modem Enhancer to bring the new technology to old external modems, and unveiled its latest communications software enhancement, Smartcom III.



You can insert a half-card in a slot next to the V-series Smartmodem.

DAVID HERBICK

The new V-series Smartmodems, which come in external and internal 9600-bits-per-second (bps) and 2400-bps versions, use a data-compression scheme to provide transmission speeds of up to 19,200 bps and 4800 bps, respectively, and are compatible with existing 2400-bps, 1200-bps, and 300-bps standards. The modem's error control reduces data transmission errors, supports international standards, and includes a migration path to synchronous communications. The automatic feature negotiation analyzes the hardware connection and selects a configuration to maximize data transmission efficiency. The external V-series 9600 modem retails for $1,299, the internal V-series 9600 for $1,199 ($1,299 with new Smartcom III communications software), the external V-series 2400 for $899, and the internal V-series Smartmodem B for $849 ($899 with Smartcom III software).

The V-series Modem Enhancer brings the new communiations technology to older external modems. The introductory price (through September 30) will be $199. After that, the price jumps to $349.

Smartcom III is a menu-driven PC communications program that requires 512k of RAM and a hard disk. It provides DOS commands, a communications language called SCOPE (Single Communications Programming Environment), an on-line editor, and the capability for simultaneous, dual communication sessions. Smartcom III retails for $249 and will include both 3.5-inch and 5.25-inch disks in each package. Upgrades from Smartcom II will cost $60 for programs purchased prior to January 1 and $30 for those purchased after January 1.

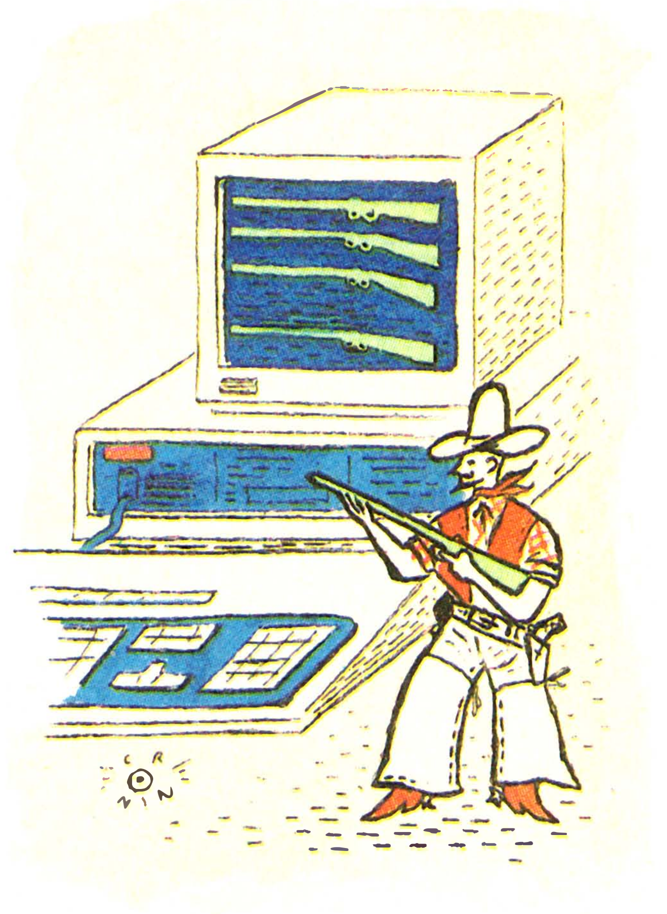
—Russ Lockwood

Compaq Defends Its PC Realm

▶ After four years of making computers rigorously compatibile with IBM's, the president of Compaq Computer Corp. said it would not follow the lead of Big Blue's Personal System/2 computers—for now.

Instead, Rod Canion recently told a media gathering that his company will take on the role of guardian of the existing personal computer standard. As part of Compaq's self-proclaimed position, Canion focused on the limitations in the PS/2 line. "In announcing these new products," he said, "IBM spent a lot of time touting the importance of its new technologies and architecture. It didn't spend much time, however, describing real user benefits of these advances."

According to Canion, most of the real advances are in software and will become available to PC XT, PC AT, and compatible users. The hardware advances, he said, do improve performance, but still don't do better than many existing computers, such as some offered by Compaq. "IBM's architectural 'advances' in hardware haven't really resulted in any significant new user benefits that couldn't have been provided within the industry standard," he said. The exception, he noted, is the new VGA graphics standard.



BRIAN CRONIN

The Micro Channel Architecture, he added, is completely incompatible with existing add-in boards and prevents users of existing non-IBM networks from adding PS/2 computers for the near future. Yet the new OS/2 doesn't require the Micro Channel architecture.

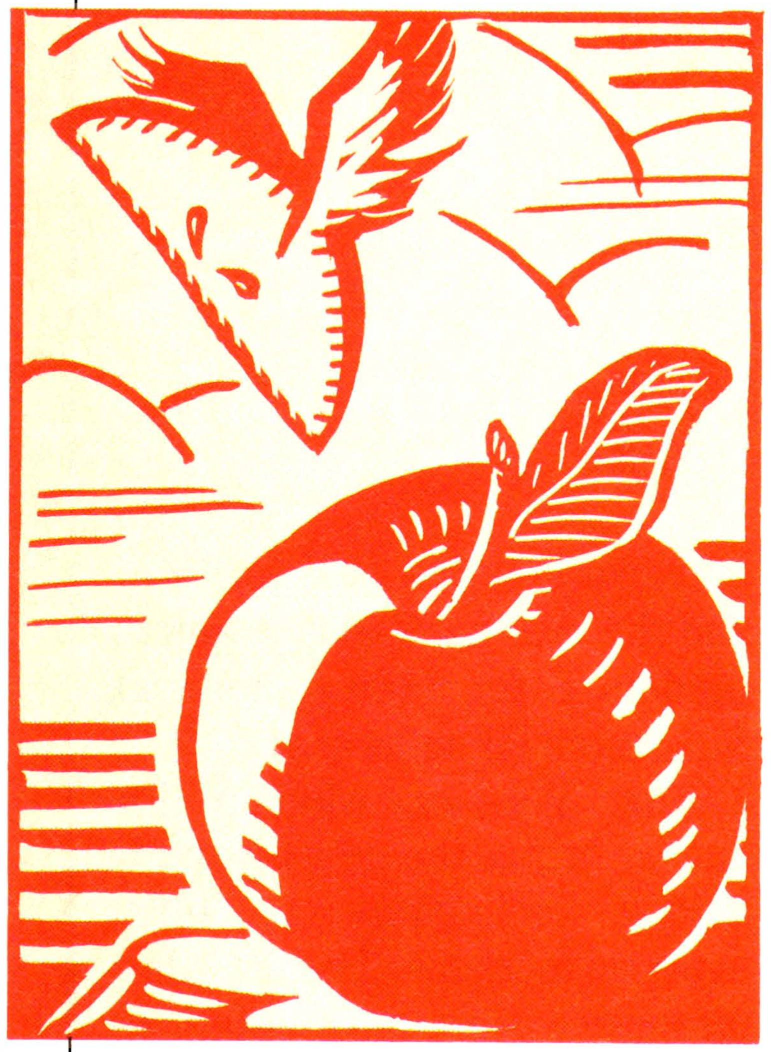
Notwithstanding Compaq's continued support for existing standards, Canion said Compaq is prepared to offer the equivalent of Micro Channel Architecture if its customers want it.

—John Blackford

Software To Go

▶ Help is on the way for portable computer users starved for applications software in the 3.5-inch disk format. The WordPerfect Corp., Orem, Utah, has addressed the demand for applications on 3.5-inch disks with its release of WPExecutive, a combination word processor and spreadsheet (that are actually condensed versions of WordPerfect and MathPlan). Jeff Acerson, the company's director of corporate communications, says WPExecutive provides laptop users with two powerful applications on a single disk for $249. The package also includes WPExecutive in the 5.25-inch disk format.

—Heather-Jo Taferner



ALISON SEIFFER

Apple Shares The Wealth

▶ Days after announcing its first dividend for shareholders and a stock split, Apple Computer, Inc., says it's going to set up a subsidiary to develop, publish, and market Macintosh and Apple II software.

The subsidiary will be spun off as an independent company within a year, with Apple as a minority owner. William Campbell, formerly Apple's executive vice-president of U.S. sales and marketing, will be president and chief operating officer of the new company. While it's a subsidiary, Campbell will report to Albert Eisenstat, who will be chairman and CEO while maintaining his current responsibilities as Apple's senior vice-president.

The strength of Apple's recent sales has left it with ample cash in search of investments. Setting up the software company will use a small chunk of this cash, estimated at more than $700 million. Some of the rest will be shared with stockholders, making Apple one of the few high-technology companies to pay a dividend. Most such companies reinvest the money, which keeps shareholders content because it normally increases bottom-line margins. The company says it now plans to pay quarterly dividends.

Additionally, the company announced its intention to split its stock two-for-one in mid-June.

—Sandra R. Reed

Lotus's Ambitious Plans

▶ Lotus Development Corp.'s recently announced agreement with IBM means that a new version of 1-2-3 soon will run on IBM's System 370 mainframe. 1-2-3/M, which will be available early in 1988, will carry both the IBM and Lotus insignias and be distributed by IBM.

That's not all Lotus president Jim Manzi told shareholders at their annual meeting.

To preclude its customers who desire a graphics interface from jumping ship when Microsoft's Excel for the PC is released later this year, Lotus also announced 1-2-3/G, a graphically based version of 1-2-3 that also includes pop-down menus, mouse control, and the ability to resize and reposition windows anywhere on the screen. 1-2-3/G, designed for IBM's Presentation Manager, will be able to run under OS/2, the new operating system from Microsoft. 1-2-3/G, however, won't be available until delivery of OS/2 release 1.1, which is expected in 1988.

For those who prefer a character-based spreadsheet, 1-2-3 release 3 will offer the same advanced features as 1-2-3/G, but without the Mac-like interface. Although it will take advantage of OS/2, it won't require it. According to Lotus, it will also provide "significant improvements" for DOS 3.x users.

New features in both 1-2-3/G and 1-2-3 release 3 will include multidimensional, layered, and linked worksheets; better-looking graphs; programmable data importation capabilities; more sophisticated error handling; and an Undo command.

Lotus has also set its sights on data base software, the current purview of the number-3 software manufacturer, Ashton-Tate Corp. Code-named Lotus/DBMS, the data base management software will be multiuser, built for local area networks, and offer integration with 1-2-3 spreadsheets. It will take advantage of OS/2 and, where available, 32-bit processors and high-performance disk storage. At least one of the Lotus/DBMS products will employ IBM's Presentation Manager graphical user interface. The new products will support IBM's Structured Query Language (SQL), which means information could be merged with mainframe and minicomputer data bases.

The Lotus Extended Applications Facility (LEAF), a kind of "glue" that will bind all the components of a Lotus system of applications products, was announced. LEAF includes a development language for use by third-party and corporate developers and sophisticated users. This capability will supposedly enable different Lotus applications, both character-and graphics-based, to exchange live data. "That means," says Manzi, "that changes in a data base could instantly be reflected in a spreadsheet, and in the tables and graphs in a word processing document."

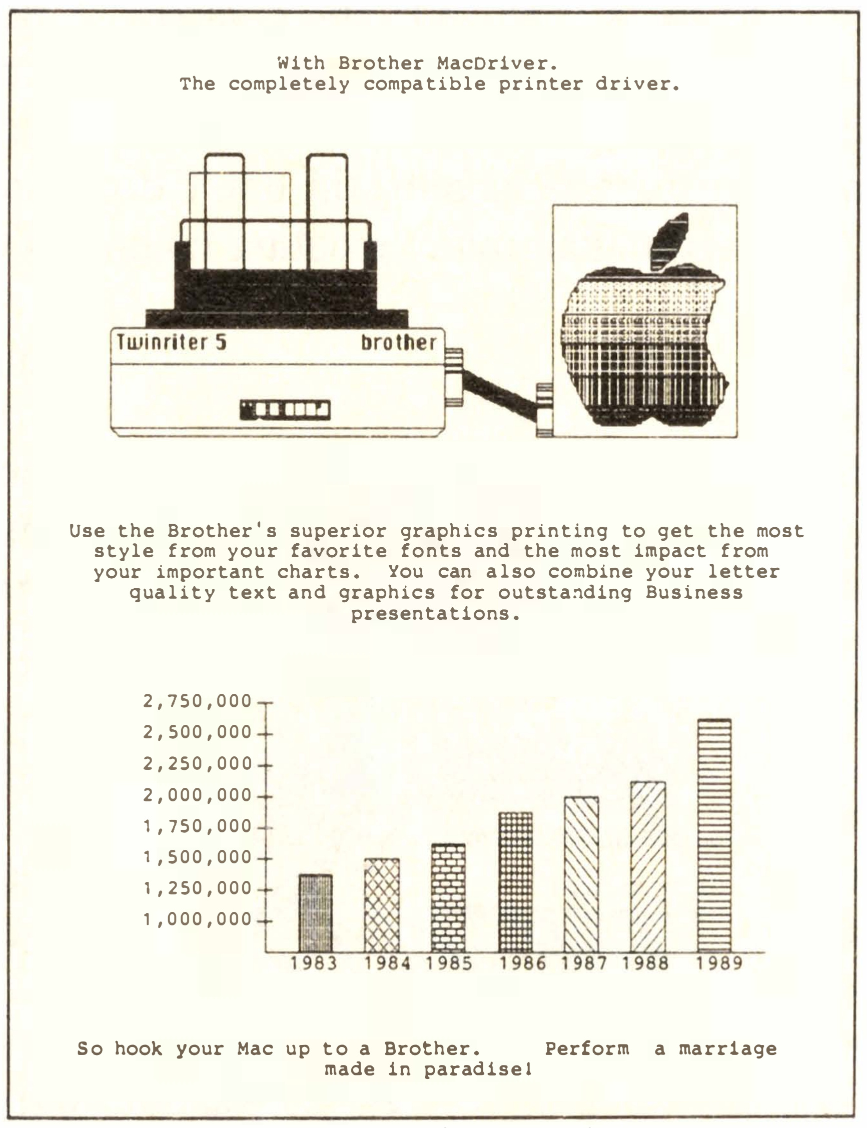
—Michael Antonoff

Twinriter Driver For The Mac

▶ Until now, when it came time to print with a Macintosh, the choice of output devices was generally limited to the Imagewriter series and the 300-dots-per-inch LaserWriter manufactured by Apple Computer. There was no middle ground if all you needed was simple letter quality output, and the ability to integrate graphics.

Enter Brother International, Piscataway, N.J., with its $99.95 MacDriver that enables most of the Macintosh models to use the entire line of Brother printers, including the company's dual-printhead dot matrix/daisywheel printer, the bidirectional Twinriter 5, and the 24-pin Brother 2024L, a high-resolution graphics printer. While you get the letter quality output, you don't lose the ability to output graphics, albeit in dot matrix mode.

The MacDriver, which was written for Brother by SoftStyle, Honolulu, Hawaii, includes the driver software and a cable to connect the computer and the printer. The interface between printer and computer is accomplished by using the Mac's Chooser desk accessory. When you total the cost of the Twinriter 5 ($1,295), perhaps a cut-sheet feeder ($325), and the MacDriver disks, this serviceable printing option adds up to a shade more than $1,700.



With Brother MacDriver.
The completely compatible printer driver.

Twinriter 5
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Use the Brother's superior graphics printing to get the most style from your favorite fonts and the most impact from your important charts. You can also combine your letter quality text and graphics for outstanding Business presentations.

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1984
1985
1986
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1988
1989

So hook your Mac up to a Brother. Perform a marriage made in paradise!

Mixing text and graphics with MacDriver.

The Twinriter 5 outputs letter quality text via its daisywheel print head at 36 characters per second (cps), and prints in draft mode with its 9-pin dot matrix print head at 140 cps. When using the MacDriver, it's possible for users to mix letter quality text and graphics on the same page (without removing the paper) by invoking software commands through the MacDriver software.

"We've received feedback from dealers, many of whom also sell Apple products, who said they wished they could sell our printers with the Mac," says the director of marketing for Brother's information systems division, Alex Schibanoff.

—Jack Bell

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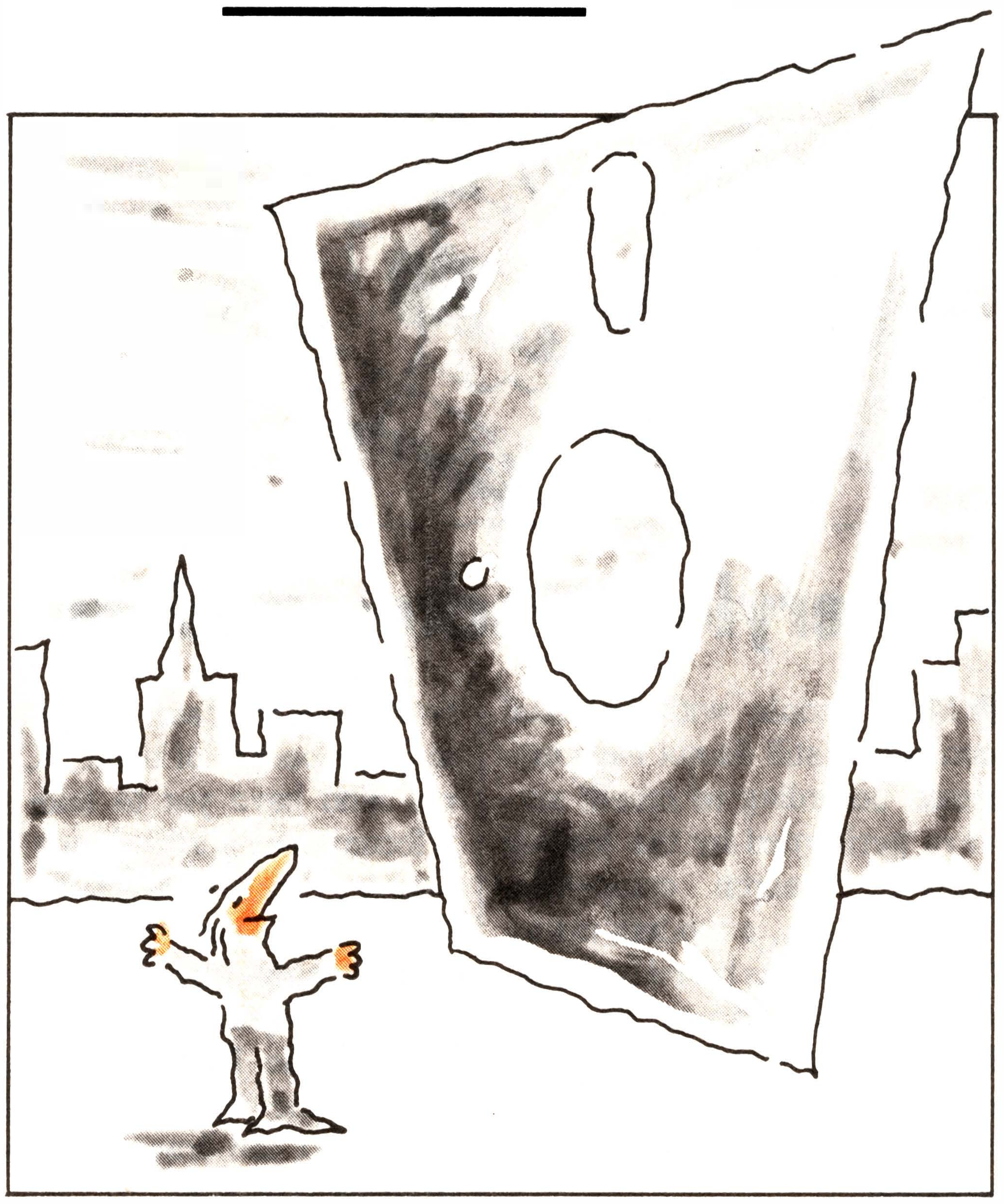

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Software Constantly Updated. The only "certainty" in computer software is that this morning's innovation will be replaced by this afternoon's. How do you protect against that?

With Macola Financial Software. It's constantly being enhanced, with new features that are designed specifically to solve actual field problems.

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(For More Information Circle 81)

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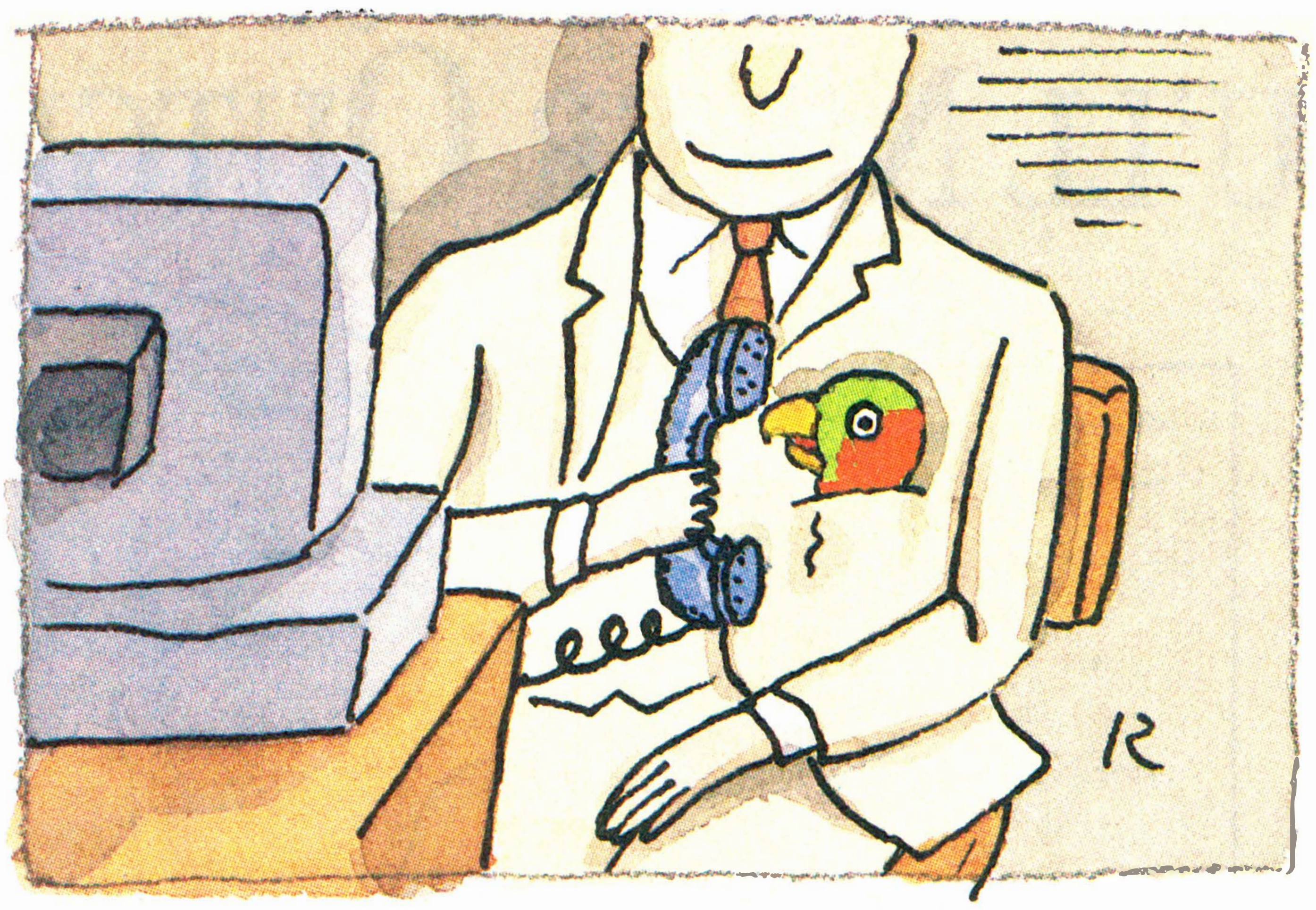
*Under development, to be released.

Planning Trends

▶ In order to meet the demands of sophisticated statistical analysts, SPSS, Inc., Chicago, Ill., has added more than 20 advanced add-on statistical routines to SPSS/PC+, the company's forecasting and time-series analysis package. The package of optional add-ons, called Trends ($395 retail), provides 10 curve-fitting methods, 12 smoothing models, regression analysis, Box-Jenkins analysis with ARIMA algorithms, and spectral analysis.

The company also released Data Entry II, a $395 menu-driven package that allows data entry, verification, and editing. The program reads and writes a variety of file types, including ASCII, dBase II and III, Lotus 1-2-3, Multiplan, SPSS/PC+, and SPSS-X. Users may create customized data entry screens and conditions may be attached to the data to help screen errors.

—*Russ Lockwood*



MARC ROSENTHAL

Batteryless Pocket Modem

▶ Most people with personal computers still do not have modems, according to recent surveys performed by the leading market research companies. Novation, Inc., a modem manufacturer which is based in Chatsworth, Calif., hopes its new $119, pocket-size 1200-bits-per-second modem is inexpensive and small enough to change that situation.

It's obvious that Novation would like to insert its modem into the pocket of those PC users who have yet to take the telecommunications plunge. Novation's Parrot 1200 is about the size of a cassette tape and weighs only three ounces. It does not require batteries or AC power. The Parrot 1200 connects to the computer's RS-232 serial port and draws its power from the computer.

—*Patrick Honan*

Postscript To HP DDL Deal

▶ Standards come and standards go. Gone now is Hewlett-Packard's exclusive support of Imagen Corp.'s Document Description Language (DDL). HP will now also support the current de facto page description language standard, PostScript from Adobe.

In late April, the office printer marketing manager of HP's Boise, Idaho, division, Steve Simpson, announced that the company has decided not to market DDL. Instead, Imagen will manufacture and market a DDL board. HP says it still plans to support the lame duck, DDL, in addition to its supporting PostScript in future releases of its LaserJet Series II printers.

According to Simpson, since announcing support for DDL, HP has received feedback from "a lot of important customers" who expressed a preference for PostScript.

—*Michael Antonoff*

Aldus Guide To Basic Design

▶ Desktop publishing has been an unabashed boon to personal computing, but there's been an ancillary effect—the proliferation of the "ugly document." Novices, equipped with a dizzying collection of fonts, typestyles, assorted clip art, and other graphic elements, produce these "ugly documents," which are, to some eyes, the equivalent of graffiti.

Eager to avoid guilt by association, the Aldus Corp., Seattle, Wash., maker of PageMaker for the Apple Macintosh and MS-DOS computers, is taking responsible measures to inform its customers about acceptable graphic design and the best way to produce professional-looking publications.

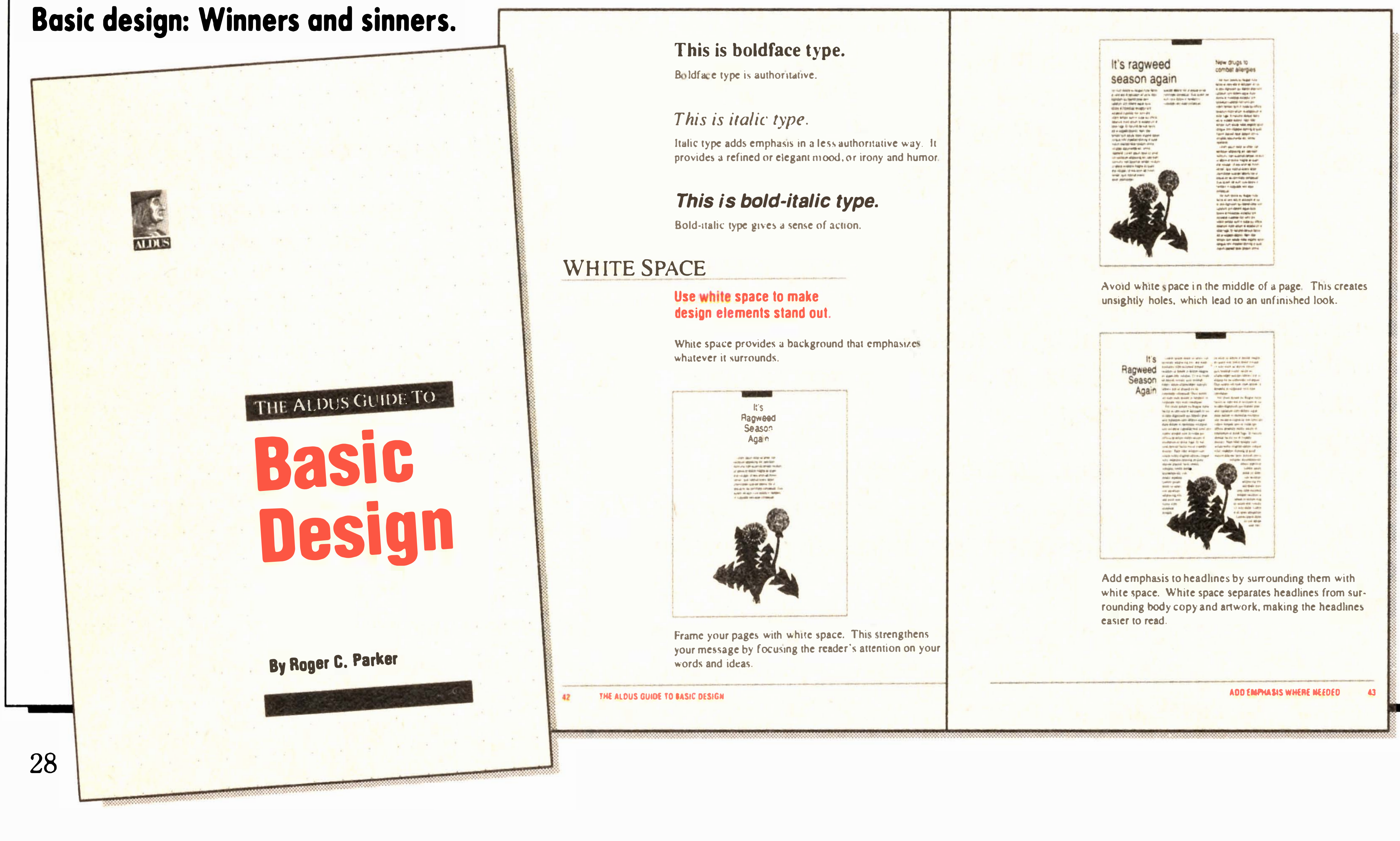
To this end, Aldus recently published a 68-page booklet entitled "The Aldus Guide to Basic Design" ($6.95). The booklet's author, Roger Parker, establishes its esthetic principle early on when he says in the introduction that "graphic design is a tool, not an end in itself. Graphic design should be unobtrusive. It succeeds to the extent it becomes transparent." Still, it's up to the desktop publisher to realize that there *are* design conventions that should be religiously adhered to.

The booklet offers principles that govern the use of grids, margins, borders, columns, captions, color, etc. There's a generous sampling of both simple and complex desktop publishing documents included as examples of good design.

The booklet will be sent, free of charge, to all PageMaker customers upon return of the product's registration card. In addition, owners of PageMaker 1.2 for the Mac will receive the booklet when they upgrade to version 2.0. "The Aldus Guide to Basic Design" is the third element in Aldus's effort to eliminate the "ugly document." The company is also marketing a package of desktop publishing templates, Design for Newsletters, and a set of training materials for use in corporations and schools, called PageMaker Classroom.

—*Jack Bell*

Basic design: Winners and sinners.



ALDUS

THE ALDUS GUIDE TO
Basic
Design

By Roger C. Parker

This is boldface type.

Boldface type is authoritative.

This is italic type.

Italic type adds emphasis in a less authoritative way. It provides a refined or elegant mood, or irony and humor.

This is bold-italic type.

Bold-italic type gives a sense of action.

WHITE SPACE

Use white space to make design elements stand out.

White space provides a background that emphasizes whatever it surrounds.

Frame your pages with white space. This strengthens your message by focusing the reader's attention on your words and ideas.

42 THE ALDUS GUIDE TO BASIC DESIGN

Avoid white space in the middle of a page. This creates unsightly holes, which lead to an unfinished look.

Add emphasis to headlines by surrounding them with white space. White space separates headlines from surrounding body copy and artwork, making the headlines easier to read.

ADD EMPHASIS WHERE NEEDED 43

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You Can Do This . . .

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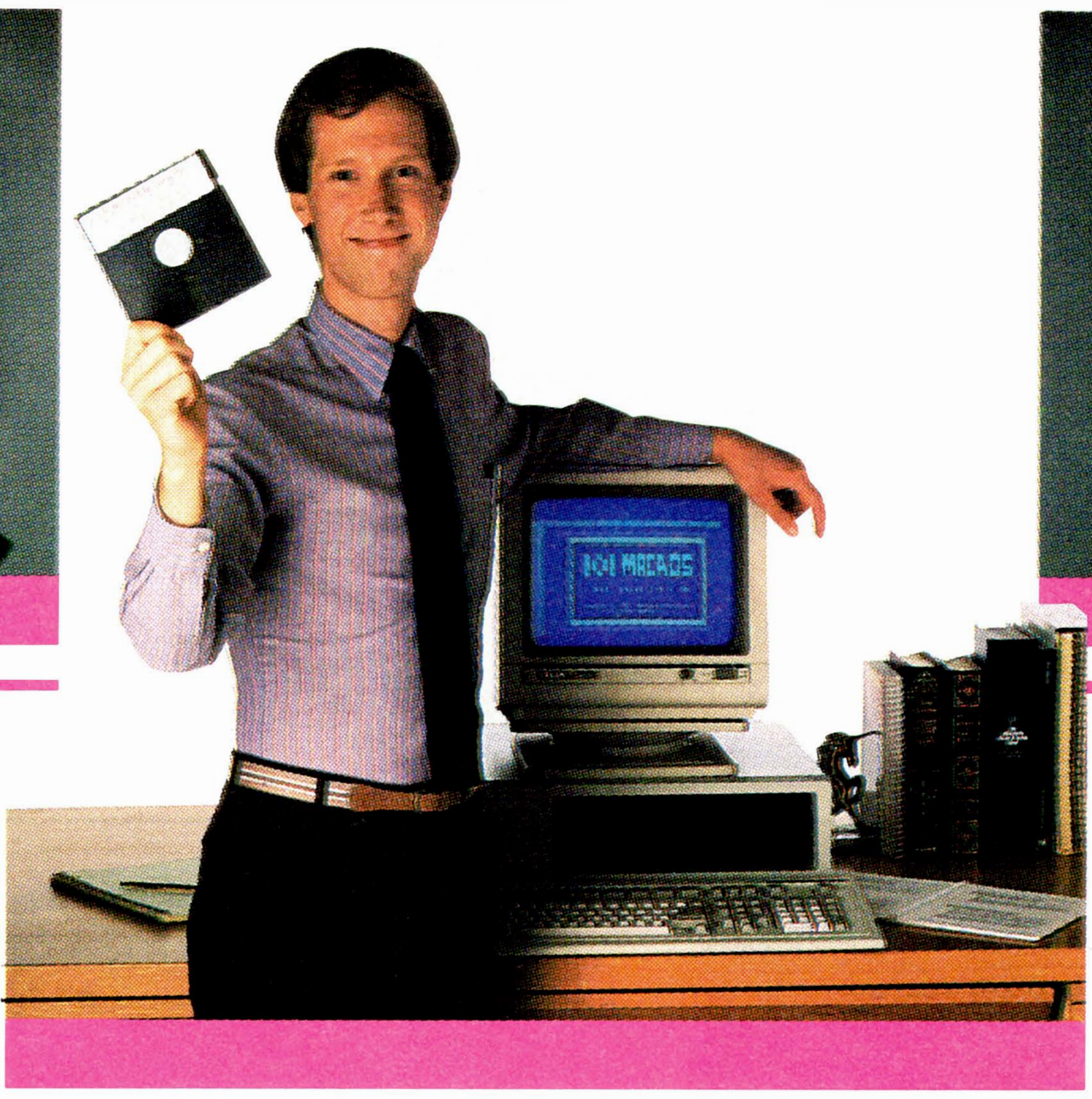

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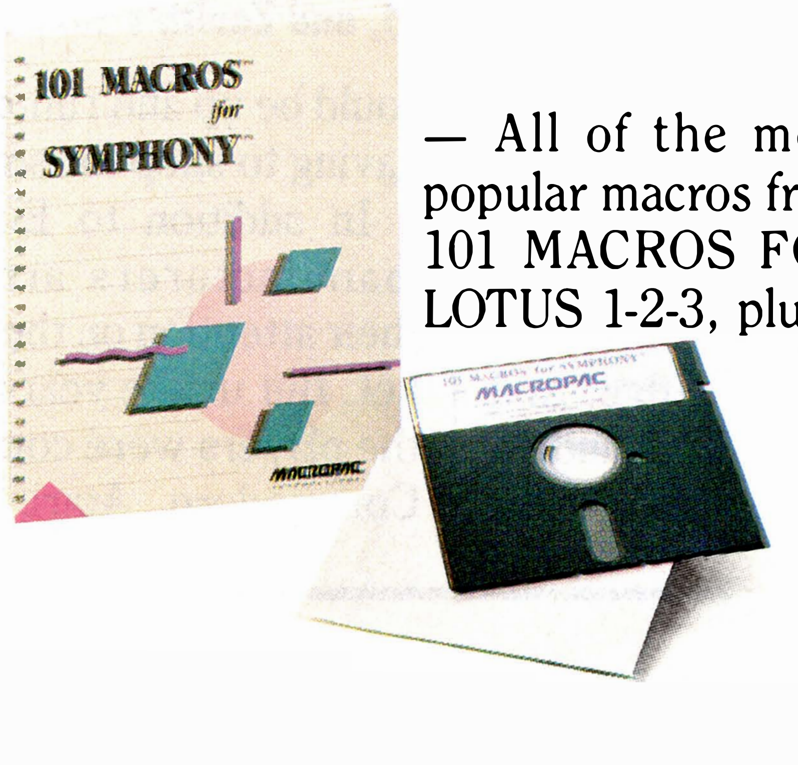

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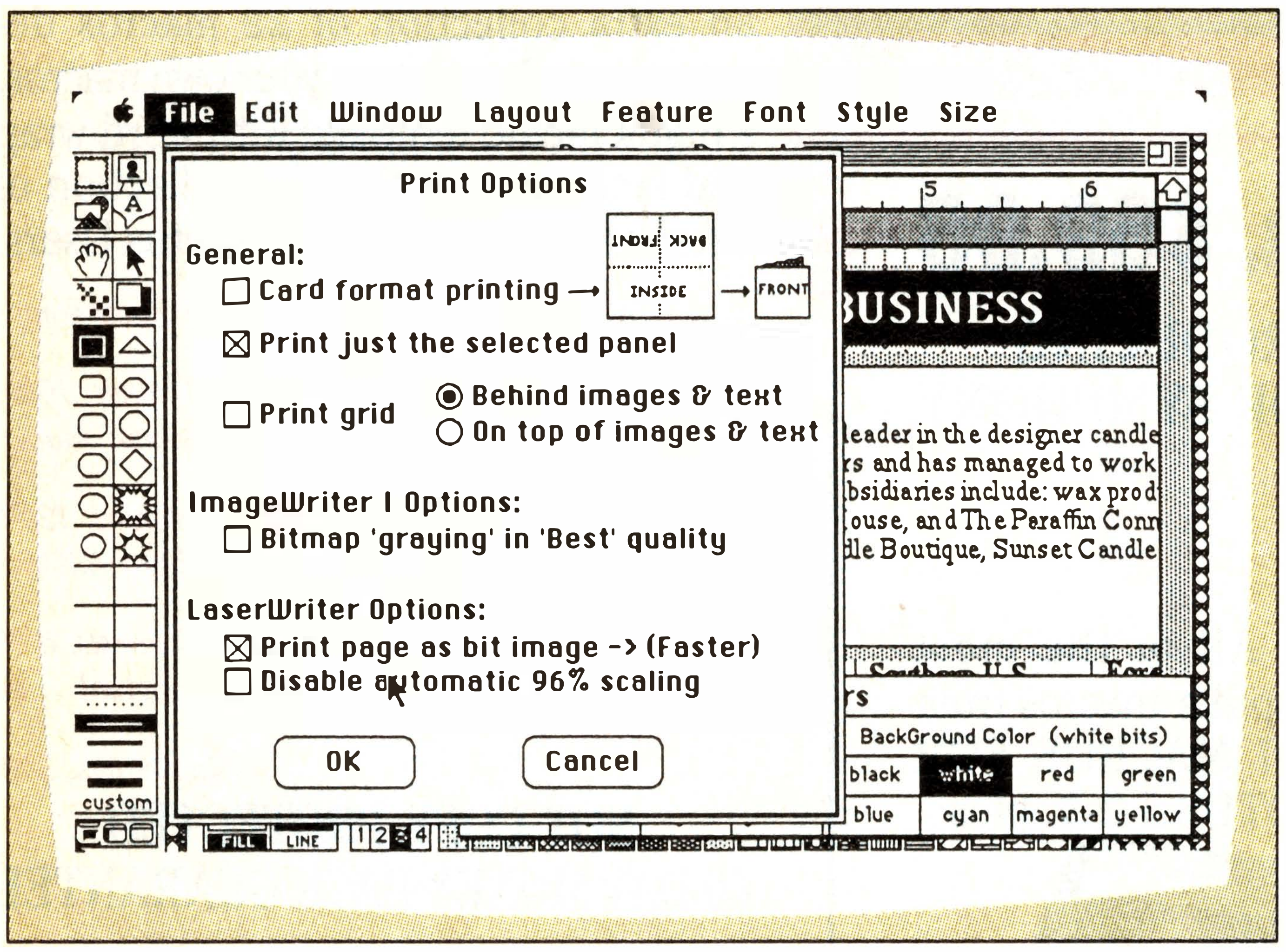
Enhancements For GraphicWorks

▶ Mindscape, Northbrook, Ill., has beefed up the capabilities and increased the price (from $79.95 to $99.95) of its GraphicWorks product for the Macintosh. It is now shipping the product in version 1.1. The program has gone through a series of incarnations, beginning with its release as ComicWorks and its repackaging as GraphicWorks. The product was written for Mindscape by Mike Saenz and MacroMind, the company which has also authored MusicWorks and VideoWorks software for the Macintosh.

GraphicWorks 1.1, which has desktop publishing capabilities, is intended for use as a graphics adjunct to more expensive page-makeup programs. Actually, the program is in competition with the likes of MacPaint, FullPaint, and SuperPaint. The program, however, has advanced text-handling capabilities that could make it attractive for the production of simple newsletters and other documents. GraphicWorks 1.1 is now capable of handling up to 40 pages, depending on available RAM and the makeup of a document's graphic elements.



Print Options

General:

☐ Card format printing →

☒ Print just the selected panel

☐ Print grid

● Behind images & text

○ On top of images & text

ImageWriter I Options:

☐ Bitmap 'graying' in 'Best' quality

LaserWriter Options:

☒ Print page as bit image -> (Faster)

☐ Disable automatic 96% scaling

OK

Cancel

GraphicWorks users can closely control printing options.

The major enhancements to the program are the ability to import and edit scanned images that have been saved in the TIFF format at 300 dots per inch and to open and export graphics saved in the PICT format to and from MacDraw; a streamlined interface; an increased number of keyboard shortcuts; the ability to output color on an Imagewriter II and to view QuickDraw colors on a Mac II; and the capacity to rotate graphics.

In addition, the company has streamlined the user interface to include a new context-sensitive help window that changes to reflect the currently selected graphic tool. For example, if the new panel icon is selected, the user is supplied with a palette of available panel shapes and a collection of borders in varying degrees of thickness.

Finally, the company asserts that GraphicWorks 1.1 has improved routines that permit printing up to 50 percent faster than the earlier version.

—Jack Bell

The New Face Of CD-ROM

▶ A relatively new method of coating CD-ROM disks, which was perfected by Energy Conversion Devices (ECD), Troy, Mich., may one day lead to the development of read-write CD-ROM drives. For now, at least, the company's phase-change technology, first used commercially on video disks several years ago, has been licensed by IBM for use on the optical disk for its WORM (write once, read many) drive for the Personal System/2 computers. The new IBM systems are the first personal computer products to use the coating. Matshusita, Panasonic's parent company, manufacturers IBM's WORM drive and licenses ECD's CD-ROM phase-change technology.

The phase-change process makes the disks less susceptible to read errors than existing types of optical disks, says David Strang, the director of optical memories at ECD.

The coating is a blend of chalcogenide alloys that changes composition (called a phase change), when struck by the WORM drive's laser. The atoms in the blend are in an amorphous or unordered state before the laser's strike and change the atoms to a crystallized or ordered state when the laser strikes the blend, says Strang. It is this change that reduces read errors. WORM drives enable you to put many files on the disk but not to alter those files. CD-ROM drives do not enable you to put any information on the disk, only to read from the disk.

—Patrick Honan

MicroPhone Is Upgraded

▶ Software Ventures Corp., Berkeley, Calif., has released MicroPhone 1.1, a telecommunications program for the Mac. According to the company's vice-president of technical support, Mike Quinn, the upgraded version of the program is "mostly a bug fix." MicroPhone 1.1 now includes improved VT-100 emulation, supports the new Apple Desktop Bus keyboard, and addresses the new MacBinary communications standard. Registered owners can purchase the upgrade for $10. A more substantial upgrade, tentatively called version 2.0, is planned for release by the end of August, according to Quinn.

–Russ Lockwood

HARDWARE UPDATE...

Compaq Computer Corp., Houston, Texas, has beefed up its Deskpro 386 computer for users who work with number-intensive and fixed disk-intensive applications. All new models of the computer will include sockets on the system board for either a 16MHz 80387 or 8MHz 80287 math coprocessor. Current owners can purchase an upgrade that includes a new system board, with the coprocessor already installed, for $999 until August 31. The company also announced the release of an optional Asynchronous Communications/Parallel Printer Board ($149), which is compatible with its entire product line. Finally, the company announced that its 101-key Enhanced Keyboard is now standard equipment on all its computers . . . **Vutek Systems, Inc.**, San Diego, Calif., has announced a new graphics board, the Deluxe EGA ($559), with a pixel resolution of 752 by 410, 640 by 480, or 896 by 350. The board enables users to draw with as many as 16 colors from a 64-color palette and supports all features of the IBM EGA, CGA, and PGA adapters . . . **Quadram**, Norcross, Ga., is now bundling its QuadEGA ProSync graphics board ($595) with a free optical mouse, Q-Mouse (a $130 retail value), plus coupons to purchase Microsoft Windows, GEM Desktop, and GEM Graph at discounts . . . **Leading Edge Hardware Products, Inc.**, Canton, Mass., has released a removable disk cartridge system called the Infinite Memory System ($1,995). It is built around a half-height drive that reads and writes data to 20Mb disk cartridges . . . **Bizcomp Corp.**, Sunnyvale, Calif., has reduced the price of its Hayes-compatible 300/1200-bits-per-second NonRisk modems. The internal IntelliModem XT (originally $549) and the external IntelliModem EXT (originally $499) now sell for $449.

Curtis, Inc., St. Paul, Minn., has released an enhanced ver-

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- Extensive business reporting available
- Transfer data to Lotus, BPI's AURA and others
- 30-Day Money Back Guarantee ($10 restocking fee)

Hardware Requirements:
- IBM PC, XT, AT and true compatibles. DOS 2.0 or later with minimum of 256K memory and with two 360K floppy diskettes or one 360K and a fixed disk.

6th

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sion of ROMDisk PC, now called ROMDisk PCE, a disk drive emulator for the IBM PC, PC XT, PC AT, and compatibles. The enhanced version can now emulate a high-capacity disk to provide 1.2Mb of data storage. As many as four PCEs can be used in a single computer to provide 4.8Mb of data storage. It is priced at $495 (180k), $595 (360k), and $1,295 (1.2Mb) . . . **Fifth Generation Systems,** Baton Rouge, La., has released version 3.0 of The Logical Connection, its peripheral sharing device that enables personal computers to share access to printers, plotters, and modems. Version 3.0 features a reset switch that eliminates the need to unplug and reconnect the system. The Logical Connection costs $495 (256k model) and $595 (512k model) . . . **Practical Peripherals, Inc.,** Westlake Village, Calif., has introduced three new models of its Microbuffer/Mini series of printer buffers. The new models, called Microbuffer/Mini 512 ($99 for 32k), come with a choice of either parallel to parallel, serial to parallel, or parallel to serial interfaces. The product comes with 32k of memory, which can be expanded to 512k . . . **The Kaypro Corp.,** Solana Beach, Calif., has enhanced its line of personal computers. The Kaypro PC-10, renamed the PC-30 ($1,595), now comes standard with the new RLL controller that gives it 30Mb of hard disk storage. The Kaypro 286 Model C ($2,995) now comes standard with a 40Mb, rather than a 30Mb, hard disk . . . **Hewlett-Packard,** Palo Alto, Calif., has reduced prices by 15 percent on the HP Vectra PC Model 50 (from $4,695 to $3,995) and the Model 60 (from $5,495 to $4,795) . . . **Advanced Logic Research, Inc.,** Irvine, Calif., has reduced prices on the Dart 10MHz AT compatible (from $2,295 to $1,595) and the Dart 12, a 12MHz AT compatible ($1,995) . . . **Vutek Systems, Inc.,** San Fernando, Calif., has released the EGA Deluxe Upgrade Kit ($99), a board designed to raise the resolution of standard EGAs from 640 by 350 to 640 by 480. The product, which plugs into the feature connector on most EGAs, does not require an expansion slot.

SOFTWARE UPDATE...

Micropro International, San Rafael, Calif., has announced the release of its current products (**WordStar Professional release 4.0, WordStar 2000 Plus release 2.0,** and **Easy Extra**) for the new IBM PS/2's standard 3.5-inch disk format. Current users of Micropro products can exchange their 5.25-inch disks for the new 3.5-inch disks directly through Micropro by calling (800) 227-5609. The 3.5-inch disk is sent free when users furnish the serial number of the program they're currently using. There is a $10 charge for shipping and handling. The cost of upgrading from the 5.25-inch version of WordStar Professional 3.31 to the 3.5-inch version of release 4.0 is $89. **GEM Draw Plus** from Digital Research, Inc., Monterey, Calif., is now available on a 3.5-inch disk for use on the IBM PS/2. Version 4.0 of **Word Finder,** ($79.95) the electronic thesaurus from Microlytics, Inc., East Rochester, N.Y., now supports Lotus 1-2-3, Symphony, Manuscript, Samna IV, DisplayWrite 4, WordPerfect 4.2, and ThinkTank. It is also available in 3.5-inch disk format for use with laptops and the IBM PS/2. Current users of version 3.4 can upgrade to version 4.0 for $20 . . . Calcomp, Anaheim, Calif., has begun shipping version 1.30 of **CADvance** ($2,500), the computer-aided design program. Current users can upgrade for $195 . . . The **Home Money Manager II,** ($89) a program for checkbook balancing and home budgeting tasks from Homecraft Computer Products, Tualatin, Ore., has been upgraded to version 1.05. The new version will be shipped free of charge to all registered customers.

Version 4.0 of **Automenu,** the shareware menu program for the IBM PC and compatibles, is now available from Magee Enterprises, Norcross, Ga. Shareware evaluation copies of 4.0 are available for $10, applicable toward the purchase price. Registered users of version 3.0 can upgrade to version 4.0 for $20, and registered users of version 2.0 can upgrade to 4.0 for $30. The program currently retails for $50 . . . Softsync, Inc., New York, N.Y. has released version 2.1 of **Reports Plus** and version 1.3 of **PC Converter Plus.** Reports Plus 2.1 ($149.95) is a utility program that enables users to compile a report from information extracted from data files. It costs $7.50 for registered users to upgrade from version 2.0. Users of PC Converter Plus ($79.95), which converts files from many data bases and spreadsheets to alternative file formats, can also upgrade for $7.50. **Desqview** version 2.0 ($129.95) is now available from Quarterdeck Office Systems, Santa Monica, Calif. The new version of this multitasking operating system now supports IBM's PS/2, including its video graphics array (VGA) display and 3.5-inch disk format. Registered owners of Desqview and Special Edition Desqview (for AST, Advanced Logic Research, and PC Designs systems) can upgrade for $50; Desqview Priority Service users can upgrade for $30; and users who purchased Desqview version 1.3 after February 1 can upgrade for $30 (with dated proof of purchase).

Persoft, Inc., Madison, Wis., has released version 2.0 of **Smarterm 240** ($345). The program enables IBM PCs and 100 percent compatibles to communicate with minicomputers and mainframes. The program is available to registered users of all previous versions for $75 . . . Macropac International, Cupertino, Calif., has now added **101 Macros For Supercalc 4** ($69.95) to its series of macro programs that currently includes keystroke savers, shortcuts, and utilities for Lotus 1-2-3, Symphony, and Microsoft Excel . . . Quixote Corp., Chicago Ill., has announced version 2.0 of **Rapidwriter** ($595). Users of version 1.1 now can upgrade for $79 . . . Buttonware, Bellevue, Wash., the maker of shareware software products, has announced that the company's products and technical support are now available electronically on both CompuServe and The Source. Buttonware is the manufacturer of the data base program, **PC-File+** ($69.95), and other shareware programs . . . The Mt. Whitney Group, Garden Grove, Calif., is offering a free diagnostic disk for users of the spreadsheet programs Lotus 1-2-3 versions 1A and 2 and Computer Associates' SuperCalc versions 3 and 4. **Tracer: The Spreadsheet Detective** ($89.95) is a RAM-resident utility program designed to detect errors in the spreadsheets . . . The WordPerfect Corp., Orem, Utah, has announced its word processing program, **WordPerfect,** is now compatible with laser printers manufactured by Talaris Systems, Inc., San Diego, Calif.

Maverick Software, Melrose, Mass., has released version 4.0 of **Keyswap** ($99.95), the keystroke recording and playback program. The upgrade for users of version 3.07D costs $25 . . . Version 3.0 of **The Network Assistant** ($195 per file server), the utility program for Novell's Netware product, is now available from Pacific Software, Walnut Creek, Calif. Registered users who purchased the product after Jan. 1 will receive a free upgrade. Registered users of The Network Assistant version 2.0x (all versions) must pay $25 for the upgrade. **Cell/Mate 2.0** ($89) is the upgraded version from Clarity Software Corp., Austin, Texas, that checks errors and produces English documentation for Lotus 1-2-3 and Symphony worksheets. Registered users can upgrade to 2.0 for $35 . . . **AutoCAD 2.6** ($2,850), the computer aided design and drafting program for IBM PC XT and PC AT systems, has been released by Autodesk, Inc., Sausalito, Calif. Users who purchased AutoCAD version 2.52 after March 1 can upgrade, through an authorized dealer, at no charge. ■

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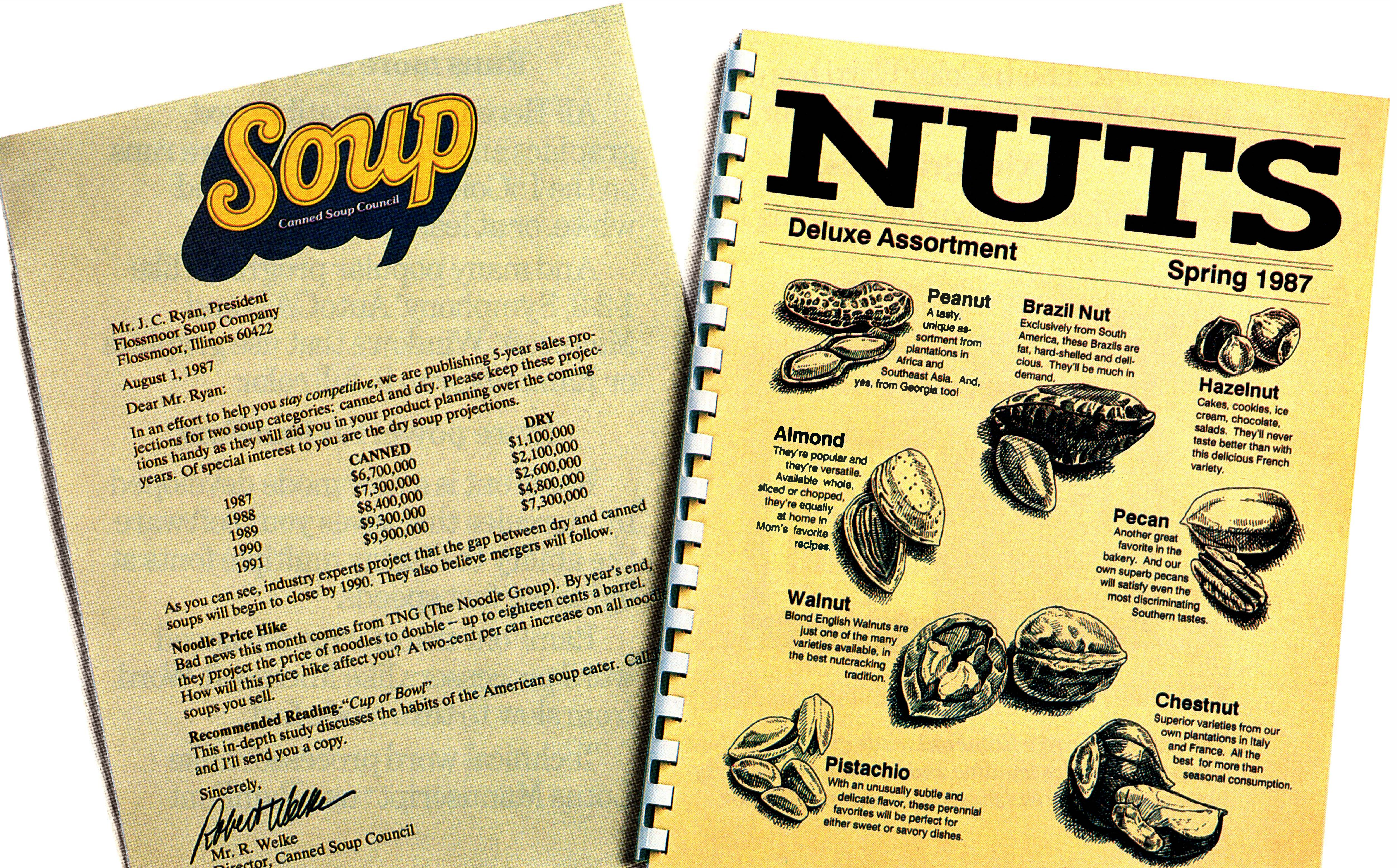

Soup
Canned Soup Council

Mr. J. C. Ryan, President
Flossmoor Soup Company
Flossmoor, Illinois 60422

August 1, 1987

Dear Mr. Ryan:

In an effort to help you *stay competitive*, we are publishing 5-year sales projections for two soup categories: canned and dry. Please keep these projections handy as they will aid you in your product planning over the coming years. Of special interest to you are the dry soup projections.

	CANNED	DRY
1987	$6,700,000	$1,100,000
1988	$7,300,000	$2,100,000
1989	$8,400,000	$2,600,000
1990	$9,300,000	$4,800,000
1991	$9,900,000	$7,300,000

As you can see, industry experts project that the gap between dry and canned soups will begin to close by 1990. They also believe mergers will follow.

Noodle Price Hike
Bad news this month comes from TNG (The Noodle Group). By year's end, they project the price of noodles to double – up to eighteen cents a barrel. How will this price hike affect you? A two-cent per can increase on all noodl soups you sell.

Recommended Reading-*"Cup or Bowl"*
This in-depth study discusses the habits of the American soup eater. Call and I'll send you a copy.

Sincerely,

Robert Welke

Mr. R. Welke
Director, Canned Soup Council

NUTS

Deluxe Assortment

Spring 1987

Peanut
A tasty, unique assortment from plantations in Africa and Southeast Asia. And, yes, from Georgia too!

Brazil Nut
Exclusively from South America, these Brazils are fat, hard-shelled and delicious. They'll be much in demand.

Hazelnut
Cakes, cookies, ice cream, chocolate, salads. They'll never taste better than with this delicious French variety.

Almond
They're popular and they're versatile. Available whole, sliced or chopped, they're equally at home in Mom's favorite recipes.

Pecan
Another great favorite in the bakery. And our own superb pecans will satisfy even the most discriminating Southern tastes.

Walnut
Blond English Walnuts are just one of the many varieties available, in the best nutcracking tradition.

Chestnut
Superior varieties from our own plantations in Italy and France. All the best for more than seasonal consumption.

Pistachio
With an unusually subtle and delicate flavor, these perennial favorites will be perfect for either sweet or savory dishes.

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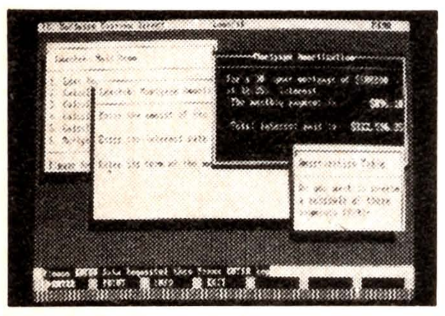

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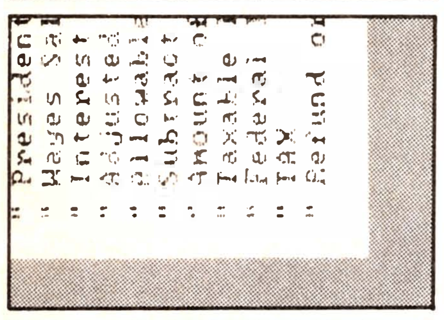
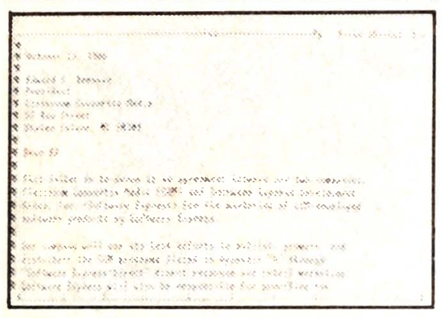


☐***1-2-3 PRINTER Sideways Printing of Spreadsheet Models*** Stop cutting and taping your spreadsheet models...1-2-3 Printer easily prints models of all spreadsheet programs sideways on your EPSON or IBM dot-matrix printer.



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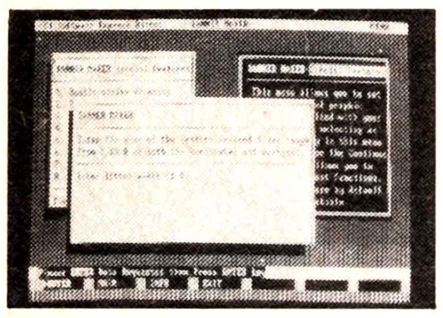
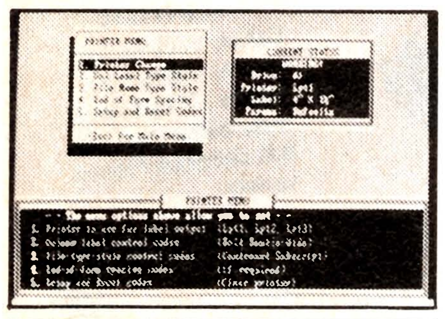
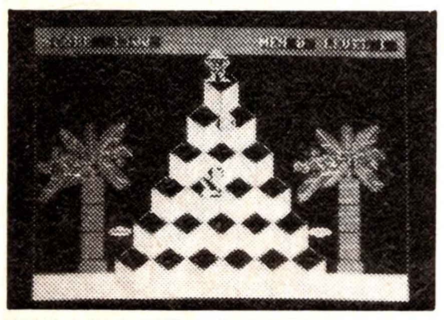


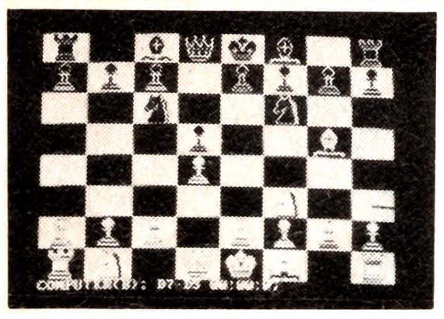
☐***BANNER MAKER Huge Printed Banners from Your PC*** Great program for special events—prints continuous banner messages in seven-inch high letters on your PC printer. Includes typestyles for EPSON/IBM dot-matrix printers.



☐***DISK FILER Organize Your Disks With Neat, Printed Labels*** Great get- organized program prints the filename contents of your disks in reduced-size type on commonly available self-stick disk labels, on your dot-matrix printer.



☐***TUT BUSTERS Fast-Paced Pyramid Action*** Help Bold Adventurer Buster Cheops reach the jewel-encrusted urn at the top of Tut's Pyramid. Fun, fast, and very sneaky! (Color/Graphics req'd.)



☐***MONACO CHESS A Good, Cheap Chess*** Great beginner's Chess. Eight skill levels and hours of fun...nothing like it at three times the price (Color/Graphics req'd.).

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☐ ***Music Scoring*** Compose and play music scores on your PC (Color/Graphics req'd). (E2251611)***$1.50***

☐ ***Name That State*** Name states/capitals - uses graphic U.S.A. map... popular and educational (Color/Graphics req'd). (E2281781)***$2.50***

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☐ ***Pascal Fractal*** Turbo Pascal source code to produce fractal images in high-res graphics (Color/Graphics req'd). (A2211421) ***75¢***

☐ ***Super Spool*** Save printing time...allows you to print documents while running other programs. (E3220461)***$2.50***

☐ ***Screen Saver*** Memory-resident utility to prevent screen burn-out - automatic timed screen turn-off (E2200341)***$1.50***

☐ ***New Directory*** A great replacement for the DOS DIR command with many more useful features, including file sort, file attributes, many display options and much more. (E3200182)***$3.50***

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☐ ***Pro-Am Golf*** A good golf game for the armchair golfer. (E2290271)***$2.50***

☐ ***Floppy Crush*** Lead a floppy through a monstrous matrix of high-impact magnets without getting crushed! A unique, tough, and very addictive video challenge...no joystick required (Color/Graphics req'd.). (E2292191)***$3.50***

☐ ***Missile Attack*** The fate of our Nation is in your hands! Defend major cities against a surprise missile attack (Color/Graphics req'd). (E3291191)***$3.50***

☐ ***Nuclear War*** A simulation of a global thermonuclear war with the Russians (Color/Graphics req'd). (E2291251)***$1.50***

☐ ***PC Pinball*** Finally, pinball for the PC! Plays just like the old mechanical games but without all of the quarters and the wasted space. Smooth flipper and ball action (Color/Graphics req'd.) (E3290191)***$3.50***

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☐ ***Origami I*** Ever want to learn Origami, the Japanese art of paper folding? This colorful graphic program shows you how! Animated display shows how to fold 6 popular shapes (Color/Graphics req'd). (E2282772)***$2.50***

☐ ***The Red Baron*** Fight a WWI dogfight with the notorious Red Baron while defending your home base. Not for PCjr (Graphics req'd). (E3290181)***$3.50***

☐ ***Frog*** Similar to the arcade favorite FROGGER (Color/Graphics req'd). (E2291171)***$2.50***

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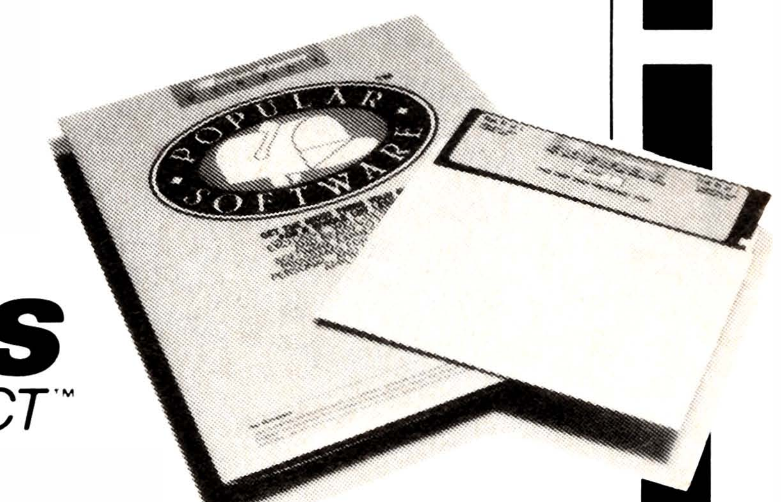

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(For More Information Circle 66)

PR7/87

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That's right. If none of these systems are right for you, then you decide. You can mix and match the components of the ideal ultimate system yourself. We'll give you $25,000 in cash. Spend it any way you like.

B A PROFESSIONAL SYSTEM

When you eat memory for breakfast and have storage requirements the size of Georgia, you crave what an 80386-based computer offers. While the office lights won't dim when you power up, the Compaq Deskpro 386 is the machine that puts the speed and raw processing muscle of a mainframe on your desk.

Your 386 comes with a 40Mb hard disk with tape backup, Compaq Color (EGA) monitor, enhanced color graphics board, a megabyte or more of RAM and 1.2Mb and 360k floppy drives. If that's not enough computing power, we'll also give you a pair of 286-based computers, the Compaq Portable II and a lightweight but powerful alternative, the Toshiba T3100, with external 5.25-inch drive. Leave your impression with a Hewlett-Packard LaserJet Plus printer, communicate over a Hayes 1200-baud SmartModem and boot up MS-DOS, WordPerfect, Symphony, SideKick and SuperKey.

C A PUBLISHING PRESENTATION SYSTEM

Which would you choose: high-resolution color or laser printing? Luckily, you don't have to. IBM's color graphics and Apple's sharp monochrome systems are both part of this graphics and publishing setup.

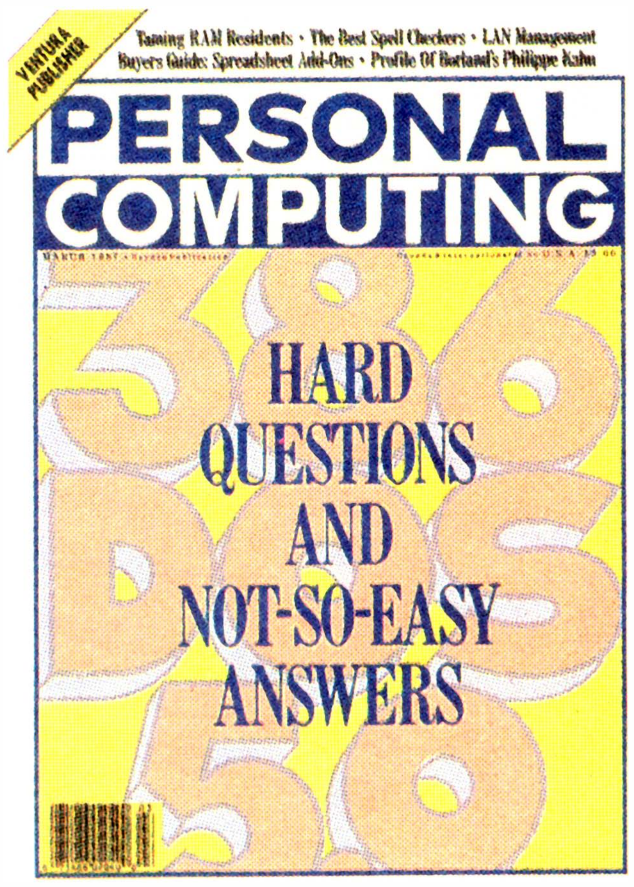
Take the new IBM XT Model 286 PC with 640k, 20Mb fixed and 1.2Mb floppy drives. Display colors galore with an IBM EGA board and high-res monitor. Print out with the versatile NEC Pinwriter, a wide-carriage, 24-pin color dot matrix that redefines the term letter quality. Become your own publisher with Ventura Publisher Edition, a hot new desktop publishing program. Use Chartmaster to create enticing color graphs. Project them through 35mm slides made with the Polaroid Palette film recorder. Or plot them using the Hewlett-Packard color plotter.

Impressed by laser printers? We've got the Apple LaserWriter Plus. Add the Macintosh Plus, a 20Mb hard drive, an 800k external drive, the Abaton Scan 300 picture digitizer and PageMaker software. Tie it all together with PC MacBridge.

D A MANAGEMENT SYSTEM

Conquer your office needs with a couple of Tandy 3000 HD computers. Equipped with 40Mb hard disks, monitors, 640k of memory and 10 expansion slots each, these IBM-compatible computers can handle most anything. Follow them with twin Tandy 1000 SX computers, each with 384k RAM and two floppy drives. Bring up the rear with two Tandy 1000 EX computers with 256k RAM and floppy drives. For printing, you'll have the support of three DWP 520 daisywheels and the high-speed DMP 2200 dot matrix, all with tractor feeds. Issue orders from the field with the Tandy 600 portable computer with 360k drive, five built-in applications and internal modem. We'll also give you a high-caliber 20 + 20-Megabyte Disk Cartridge System and a 20Mb hard disk on a card. As for software, take four packages each of Lotus 1-2-3, the leading spreadsheet; MultiMate Advantage, the heavy-duty word processor; or Enable, the integrated program.

You may have already won the ultimate computer system of your choice worth $25,000.00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2. Be sure the Sweepstakes Entry Certificate is completely filled out.
3. Mail the Certificate today.

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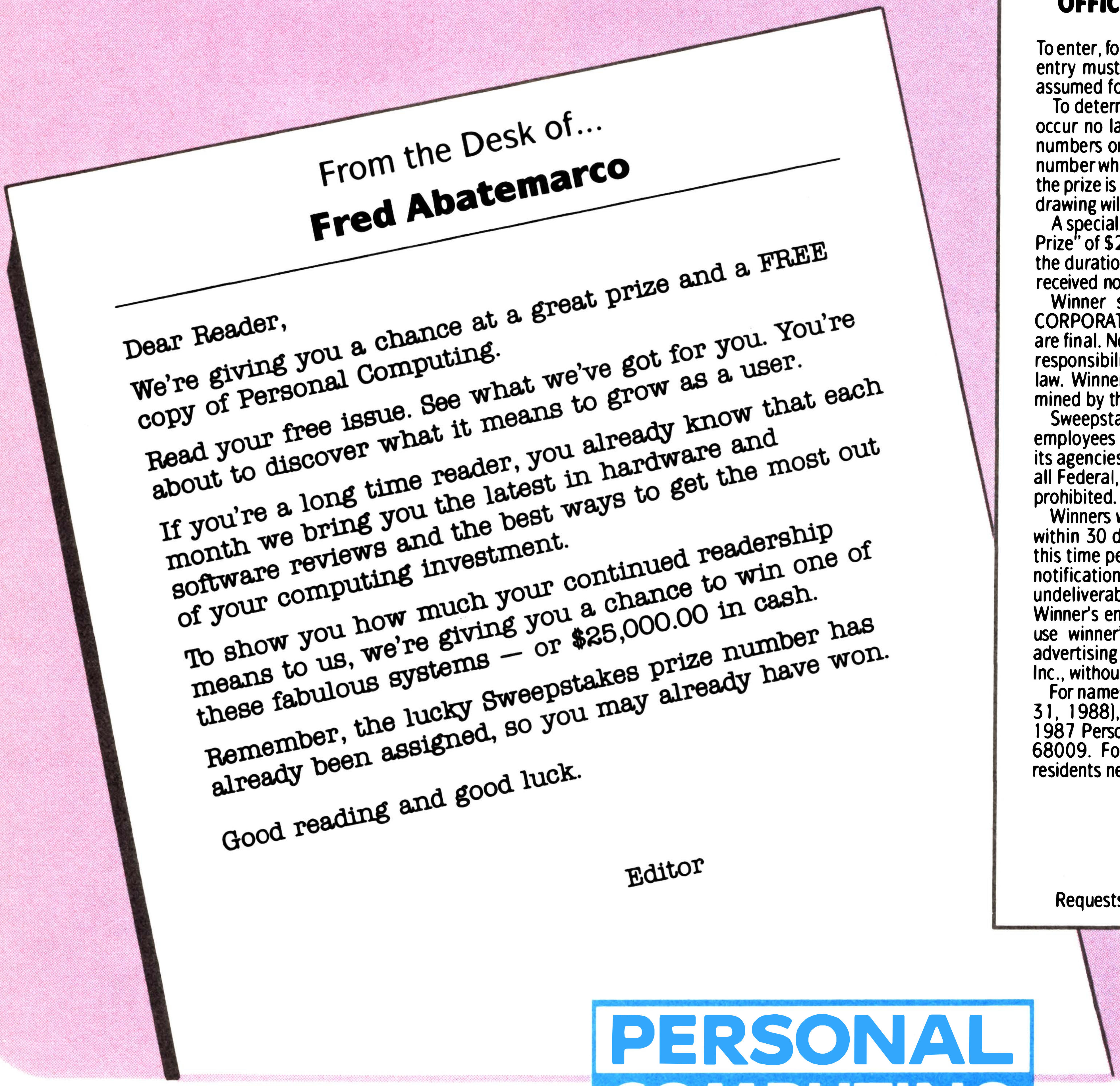

From the Desk of...

Fred Abatemarco

Dear Reader,

We're giving you a chance at a great prize and a FREE copy of Personal Computing.

Read your free issue. See what we've got for you. You're about to discover what it means to grow as a user.

If you're a long time reader, you already know that each month we bring you the latest in hardware and software reviews and the best ways to get the most out of your computing investment.

To show you how much your continued readership means to us, we're giving you a chance to win one of these fabulous systems — or $25,000.00 in cash.

Remember, the lucky Sweepstakes prize number has already been assigned, so you may already have won.

Good reading and good luck.

Editor

OFFICIAL RULES — NO PURCHASE NECESSARY

To enter, follow the directions published in this offer. For eligibility, your entry must be received by December 11, 1987. No responsibility is assumed for lost, late or misdirected mail.

To determine the winner of the $25,000 prize, whose selection will occur no later than February 29, 1988, the individual sweepstakes numbers on submitted entries will be screened for the prize winning number which has already been pre-selected by computer. In the event the prize is not claimed via the return of the winning number, a random drawing will be held from among all entries received to award the prize.

A special random drawing will be conducted to award the "Early Bird Prize" of $2,500 from among all qualified entries received throughout the duration of this offer. To qualify for the drawing, an entry must be received no later than the eligibility deadline date printed thereon.

Winner selection is under the supervision of the D.L. BLAIR CORPORATION, an independent judging organization whose decisions are final. No substitution will be made for any prize. Taxes are the sole responsibility of the prize winner. Offer void wherever prohibited by law. Winners will be notified by mail. Chances of winning are determined by the total number of entries received.

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For names and addresses of the prize winners (available after March 31, 1988), send a separate stamped, self-addressed envelope to: 1987 Personal Computing Winners, P.O. Box 4836, Blair, Nebraska 68009. For an additional entry form, send a stamped, (VT, WA residents need not affix return postage) self-addressed envelope to:

Personal Computing Sweepstakes
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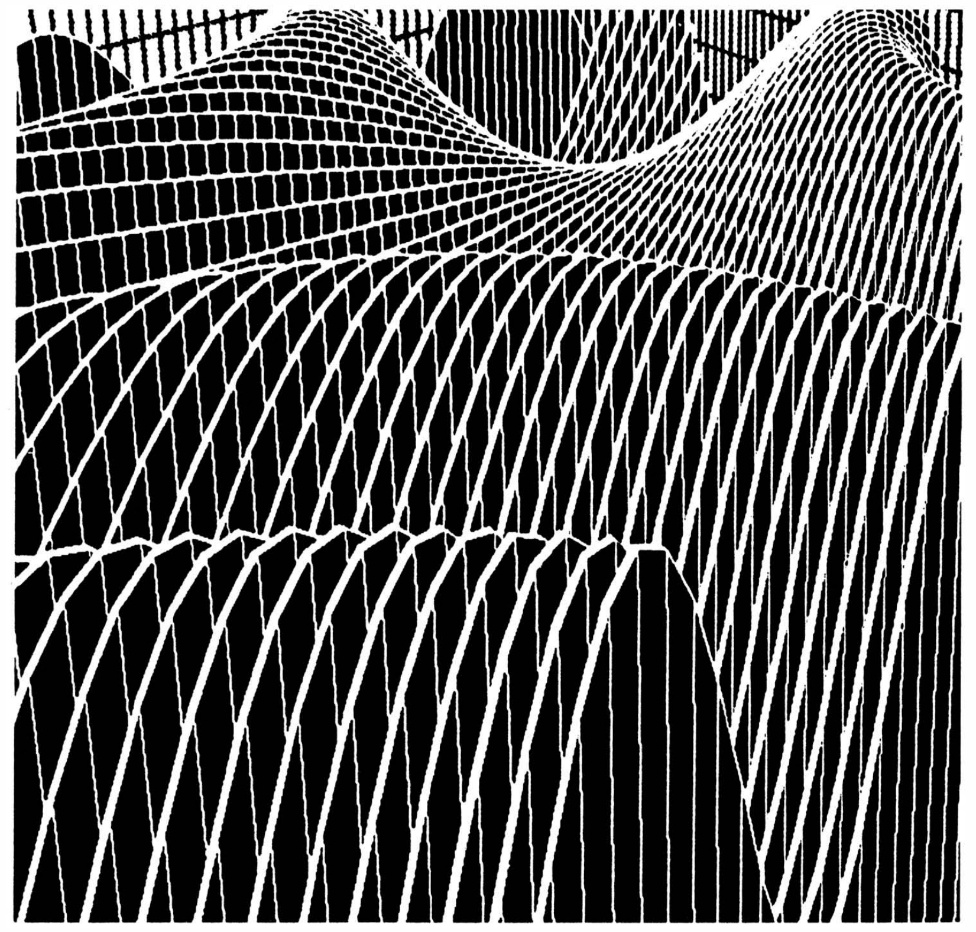
2.0 ENABLE IN A NEW PERSPECTIVE

Every now and then in the software industry something momentous comes along and changes attitudes overnight. The introduction of Enable 2.0 (with a LAN version, and now available on 3½″ disks) promises to be one of those events.



Enable with Perspective.™ Talk about something to get excited about!

Perspective. *The* graphics package. As *Personal Computing* just wrote, "other products cannot even come close."

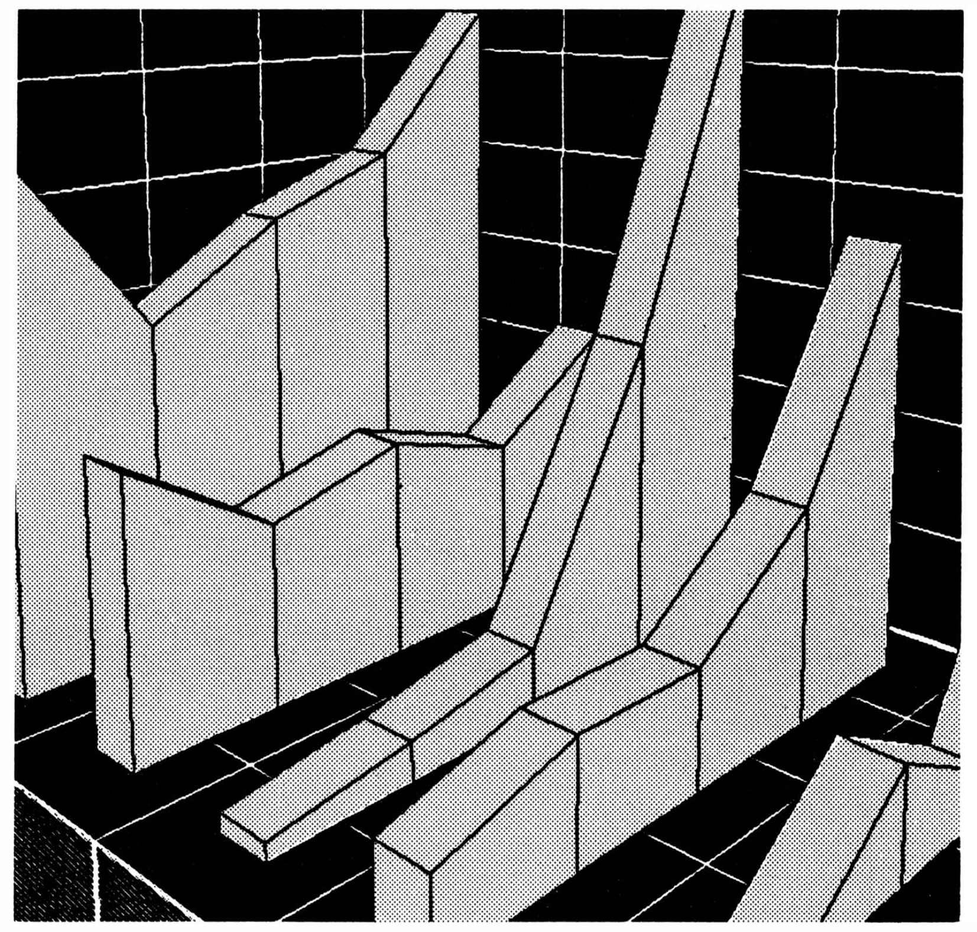
Now, Perspective is fully bundled in Enable 2.0. Which means you can now have an integrated system beyond all others. Word processing, spreadsheet, DBMS, communications and mind-boggling graphics all in one. All offering the power business users need (for confirmation, just read our "Raves" column to your right).

And what Perspective offers is truly awesome:

- 15 2-D and 32 3-D graphs from Enable's spreadsheet or database
- Menu exhibiting all graph types for selection
- Graphs can be resized, and rotated 360 degrees or on any axis for best viewing angle
- 180 choices of shades and patterns for various graph elements
- Automatically converts data from one 2-D chart to another, or from 2-D to 3-D; all graph types compatible.

Note: the six remarkable 3-D graphs you see on these two pages were drawn using Perspective. Which should give you greater perspective on Enable 2.0's vast potential.

Perspective™ is a registered trade mark Three - D Graphics, Inc.



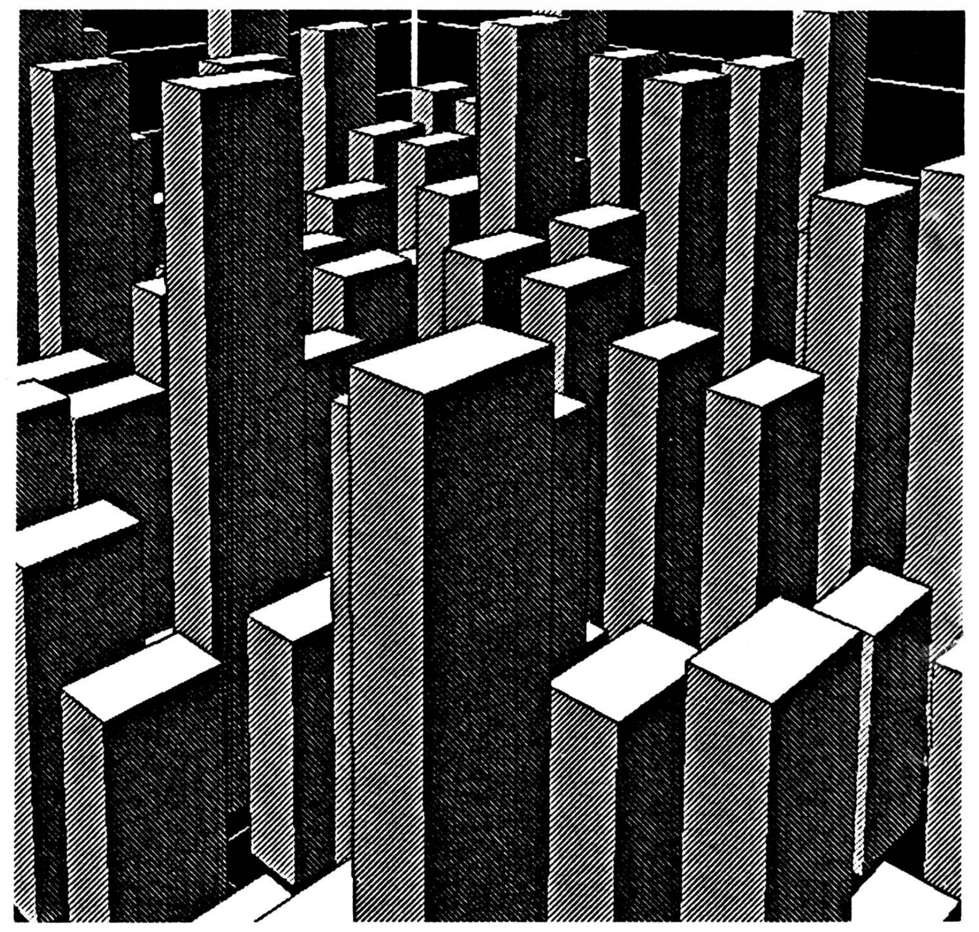
100+ new features and enhancements to enhance your productivity.

Not bells and whistles, but meaningful improvements! Across all modules. Brought about by listening to our special User Advisory Board, calls and letters to our Customer Support staff and continuing dialogue with such demanding Enable users as the U.S. Air Force, AT&T and Hughes Aircraft.

Here are some 2.0 enhancement highlights:

- A High-Level Language Interface [Basic, C, Pascal]
- Expanded macro facility
- Enhanced report language
- Enhanced menu generator
- Simplified installation/getting started procedure.
- 80,000 word Proximity/Merriam-Webster Linguibase™ spelling checker
- Row/column sorting on spreadsheets
- Simultaneous display and updating of spreadsheet and graph
- Enlarged Import/Export file compatibility with a wide range of popular software*

And remember, these are improvements to what is already recognized as the most fully featured, most powerful, most customizable, tightly integrated software system in existence.



More and more users are using more and more of Enable.

In the tough, spec-filled world of the Federal Government, Enable is by far the number one selling integrated software.

In the corporate world, after thorough testing and trial usage, dozens upon dozens of Fortune 1000 companies have specified Enable.

And thousands of smaller companies have come to the same conclusion: Enable has an incredible ability to handle a nearly unlimited range of jobs.

- From the Dow Corning Economic Evaluator, "It's not really a matter of finding ways to use Enable. I haven't found a way *not* to use Enable."
- From a DP Manager for Postal Service HQ, "When people come in for a spreadsheet, we give 'em Enable. Database . . . we give 'em Enable. Word processing . . . we give 'em Enable. I simply can't see us outgrowing Enable."
- From Xerox, after benchmarking the three leading integrated systems, "[Enable had] the user-friendliness and methodology of integration we were looking for."

As a complete off the shelf product or as a base product on which to build special applications, there just isn't a package on the market that can touch Enable. Especially now that 2.0 is here.

One after another, the raves keep flowing in.

Raves! Raves! Raves! Reviewers were lauding Enable even before 2.0.

"A masterpiece of engineering . . . Enable clearly outdistances its competitors. It is, without a doubt, the first of a new generation of integrated software products."

(PC Products)

"The great thing about Enable is that it gives you all the benefits of a collection of top-notch stand-alone packages—plus integration to boot. It's what Symphony was supposed to be."

(Software News)

"If you are looking for one program to do it all, this is the one."

(PC Magazine)

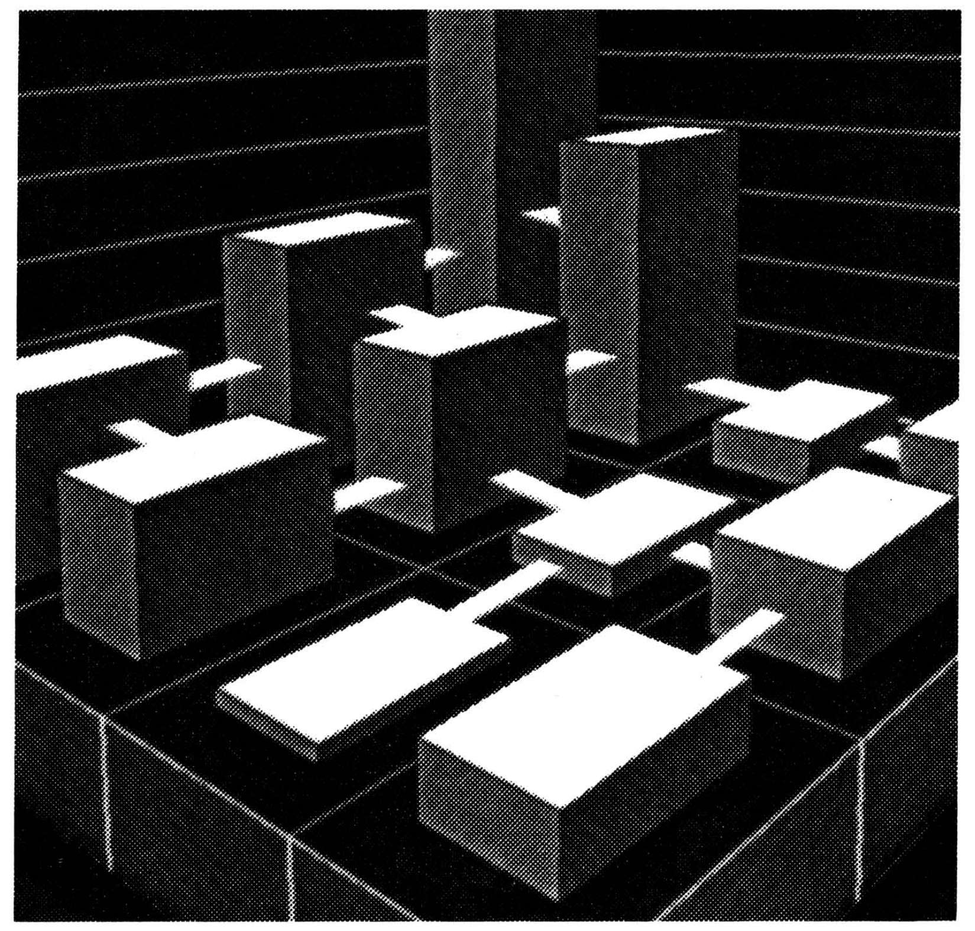
"Enable . . . may be the first program to make you give up your dog-eared WordStar, dBASE, Smartcom and Lotus 1-2-3 disks."

(Business Software)

"Each of the five modules . . . has a depth of features and functionality rare in an integrated package . . . "

(InfoWorld)

Enable 2.0 is bound to generate a whole new file of raves! Including your own.



Enable/LAN. A great new way to make connections.

Enable/LAN gives you the most useful, powerful PC network software on the market.

Consider, a system with all the benefits of Enable 2.0 itself:

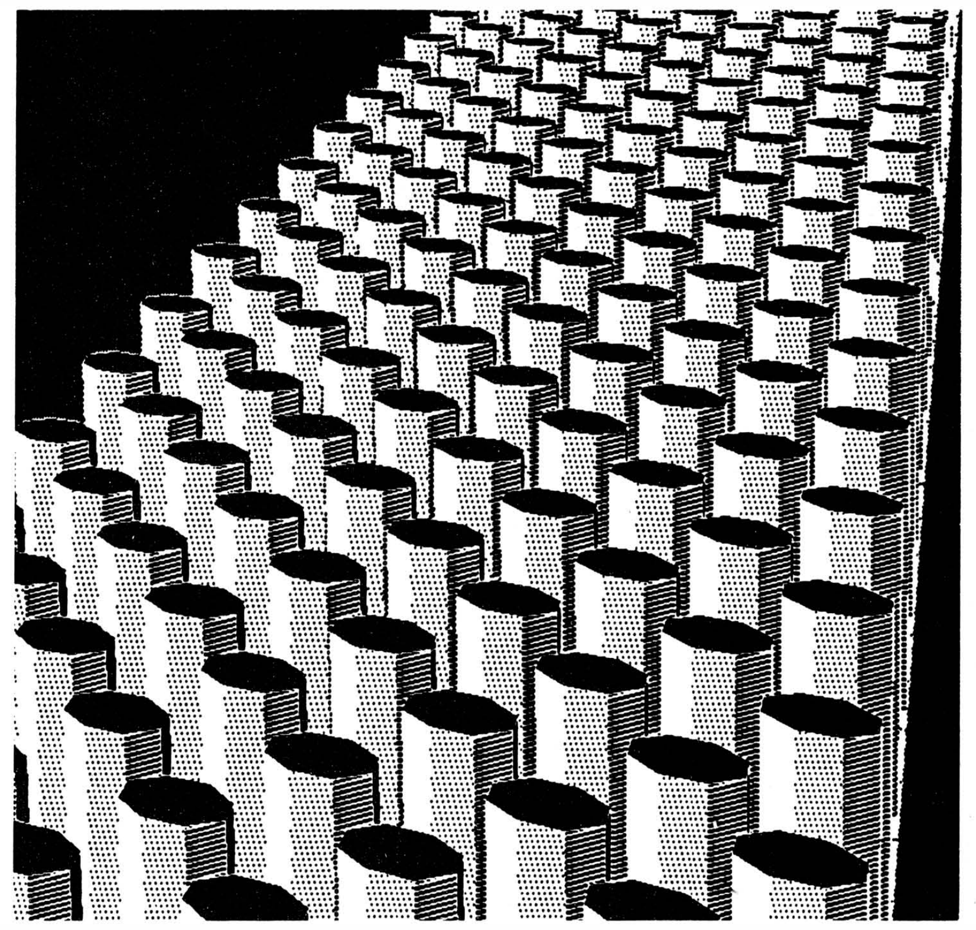
- System design, documentation and support making ease of use a reality.
- Word processing, spreadsheet, graphics, DBMS and communications equal to the functionality of the best stand-alones.
- Smooth, simple, fast integration between applications.

With all the LAN features you'd expect:

- Password protection for all applications.
- File and record locking for all applications.
- Compatibility with all the major networking software.

Plus some unexpected benefits. Just one example: Enable/LAN is import/export compatible with the most popular PC software, meaning you can share files on your network from packages that don't currently offer LAN versions, such as 1-2-3.

To find out more about all you can do with Enable/LAN, land on your favorite dealer's doorstep.



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  - –Discounts on Enable upgrades
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Dept. P

enable™
integration without compromise

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(For More Information Circle 88)

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*Compatible with WordStar, MultiMate, EasyWriter, VolksWriter, PeachText, DCA, DIF, ASCII, 1-2-3, VisiCalc, SuperCalc 3, SYLK, dBASE, Condor 3, PC File III.

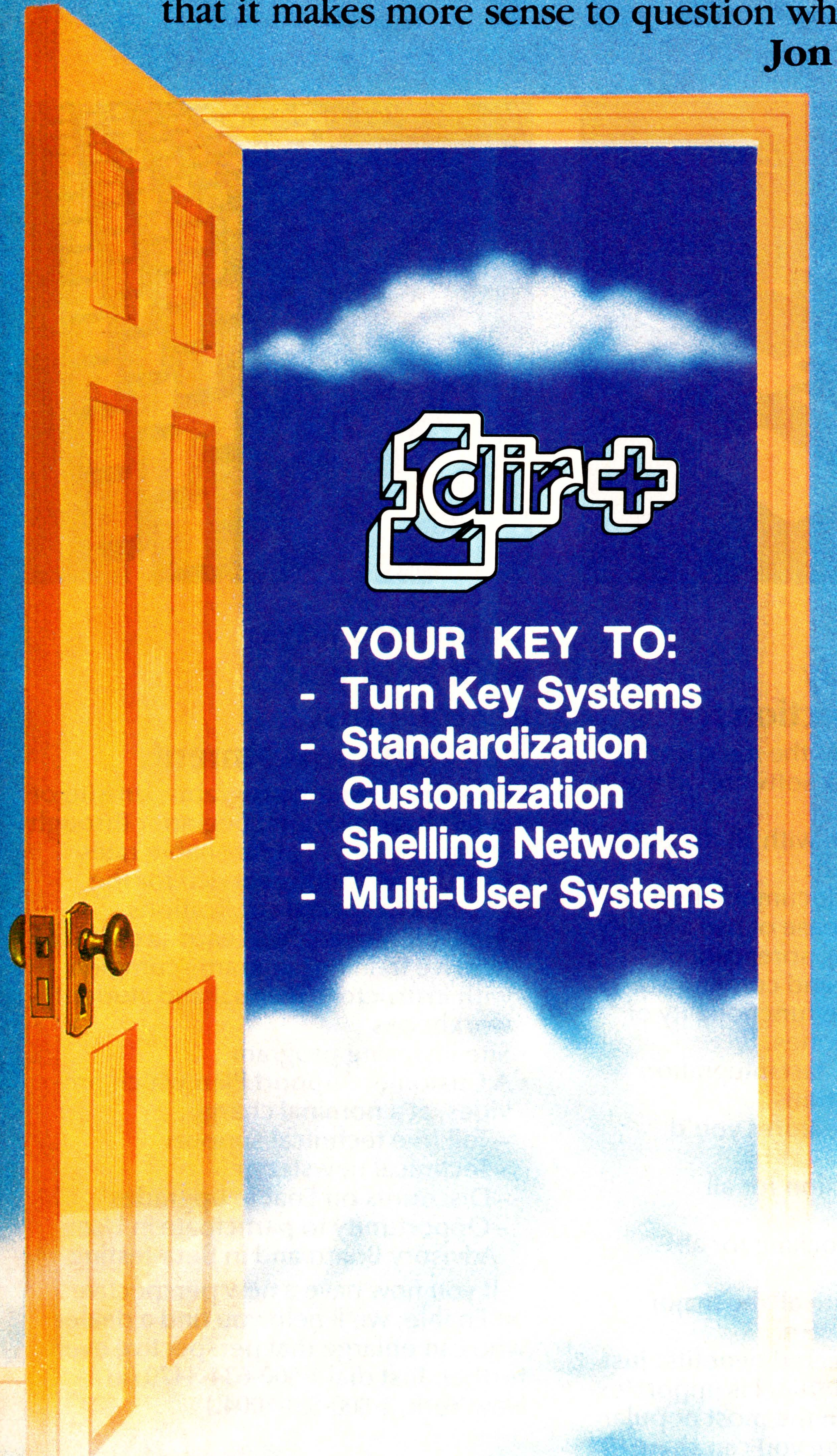
"WONDER" PLUS

"...opens up a lot of possibilities."

"...for network managers, dealers, VARs and power users **1dir+** opens up a lot of possibilities."

"Bourbaki's **1dir+** is a remarkably powerful and unique program that goes far beyond most other DOS shells. There are so many possibilities intrinsic to **1dir+** that it makes more sense to question what the program can't do than what it can."

Jon Pepper PC Magazine February 24, 1987



WHAT IS 1dir+?

Designed as a systems integration tool, **1dir+** ("WONDER" PLUS) is a DOS shell that combines "State of the Art" file management capabilities, with custom menuing. Although infinitely customizable it requires none. "Right Out of the Box" it provides the tools to organize and manage hard disk files beyond the limitations of DOS and other system utilities. Moreover, **1dir+'s simple reason for existence is to make computer operation easier for any and all users.**

INSTANT TURN KEY SYSTEMS

No better environment exists today for both creating Turn Key Systems and using them. **1dir+'s** point and shoot operation makes systems as easy to set up as they are to use. Anyone with a minimal knowledge of DOS can create custom menus and custom commands for any application or user. If you're interested in expanding the programmability of **1dir+,** the NEW **MuSCLe** Professional Developers System may be for you.

INCREASE PRODUCTIVITY

Whether you're an individual user or involved with multi-user systems and networks, if you have the need to standardize operations, **1dir+** provides the solution. **1dir+** Systems simplify support, require less training, and won't compromise your ability to customise as needed.

SUGGESTED RETAIL PRICE

1dir+	$95.00	(site licensing options available)
MuSCLe	$50.00	

SYSTEM REQUIREMENTS:
IBM PC, XT, AT, 3270AT, SYSTEM/2 or Compatible
256K Minimum Available-(after DOS & resident programs)
DOS 2.0 or later / higher Hard Disk Recommended

COMPATIBLE NETWORKS INCLUDE:
IBM Token Ring, 3COM & Novell

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1dir+ is available through most major dealers.

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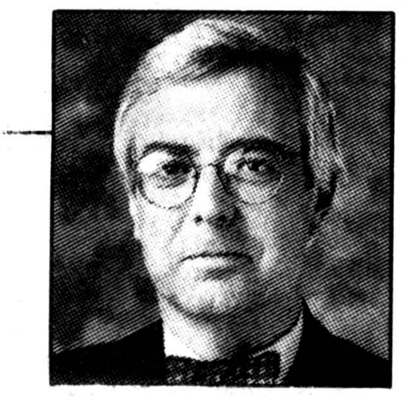
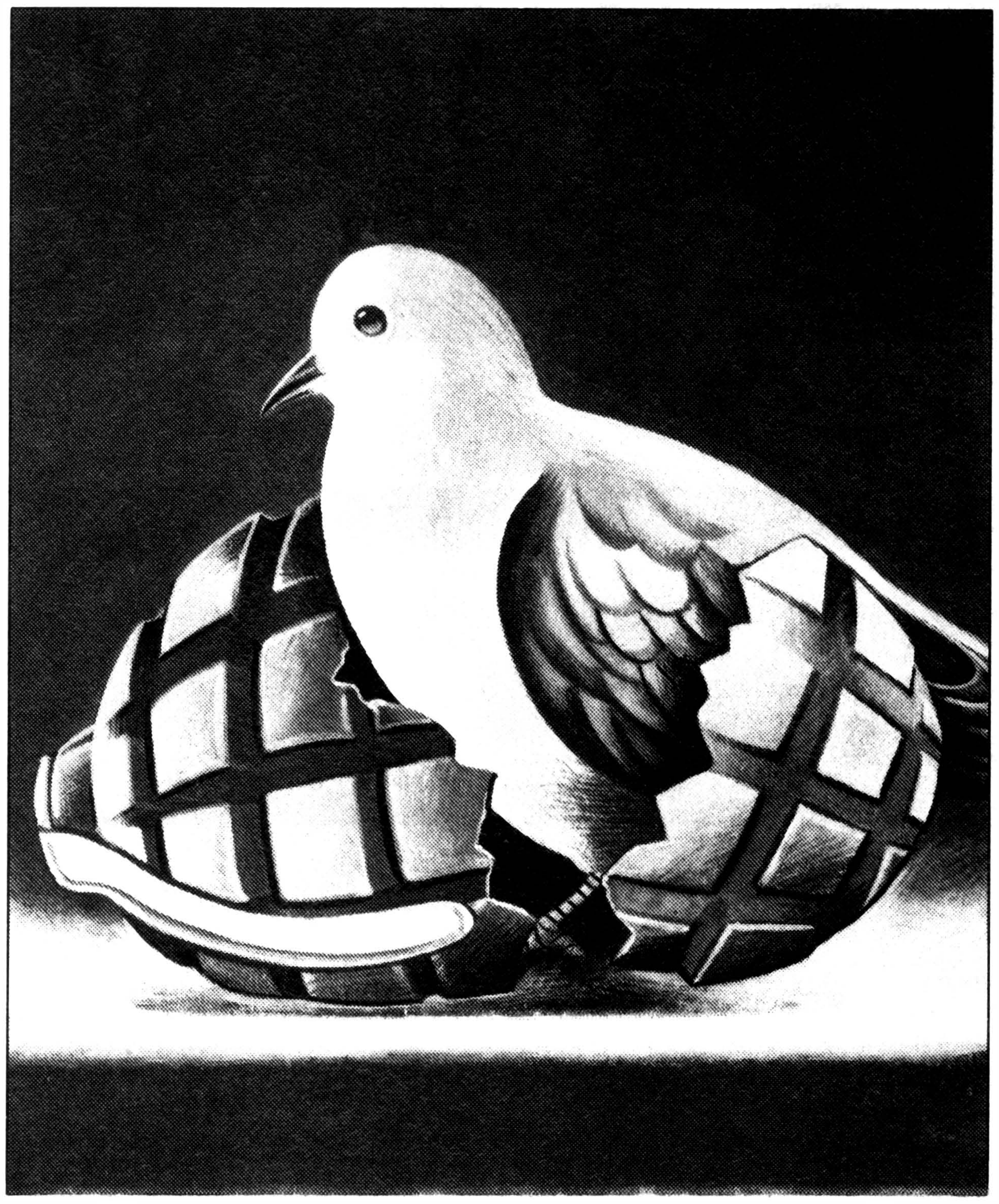
INDUSTRY WATCH / Richard A. Shaffer



IBM: Not So Fearsome



Never let facts interfere with a good story. That was one of the signs posted near the rewrite desk at a newspaper where I once worked. Another read, "Good Stories Wrote Cheap, Your Home or Mine." But my favorite was "If you can't be right, be first." When it comes to unannounced products from IBM, almost no one can be right; until the actual announcement, even many insiders at the company don't know the most important details. That, however, does not stop the trade press—or the industry analysts—from trying to be first. Now that we know the facts about IBM's latest announcement, it's instructive to review what turned out to be—what shall we call them?—nonfacts, artifacts, factoids.

According to the scoops, IBM was going to close the box in its new product line, making compatibles impossible to create. It was going to adopt a proprietary operating system, abandoning the installed base. It was going to use its own versions of the Intel microprocessors. It was going to introduce a low-priced "clone killer" aimed at the home and education markets.

The correct answer turned out to be none of the above. IBM did just what it said it would do; it continued to support the concept of an open system.

Had IBM moved to a proprietary operating system instead of one that is proprietary only in part, the industry would have been split into two camps. The installed base of IBM-compatible software and hardware now is large enough—about 7 million PCs and compatibles—that IBM could well have ended up with a marketplace rebellion of the order that Coke faced when it tried to foist New Coke off on the public. Unlike Coca-Cola, IBM saw the strength of its old product.

As a result of IBM's continued support of an open system, the reports of the death of the clones turn out to have been greatly exaggerated. Most of the computers that are responsible for IBM's now well-known loss of market share sell for much less than the least expensive products in IBM's new line. True, the more powerful clones will come under pressure in the months ahead as IBM reduces the price of its older machines to make way for new models. Overall, however, IBM seems to have abandoned the so-called commodity end of the market—as it said it would. As a result, it isn't a factor in the home market and, I think, it probably won't make much headway in education, either.

For makers of compatibles, as opposed to clones, the future also is brighter than forecast. The company that set the industry standard, IBM, has made it clear that it intends to continue supporting it. IBM is using industry-standard microprocessors, and existing software will run on its machines. If you're an established maker of compatibles, it's in your interest for IBM to make it difficult (albeit, not impossible) to duplicate its latest systems. Difficulty eliminates the thieves who merely copy (or, clone) what IBM has done, and provides a substantial barrier of protection for compatible makers that already are well financed and that also have expertise in custom-circuit and systems design.

Because IBM is publishing the specifications of its new machines, such companies as Compaq and Tandy should be able to develop legal functional equivalents of many of the essential parts. Those companies without expertise of their own or the money to hire it should be able to purchase the necessary parts from companies that already have specialized in filling such demand: Chips & Technologies, for example, or Phoenix Technologies. Developing equivalent circuits will be expensive; it will probably cost millions of dollars. But what is a few million or tens of millions in a market worth billions?

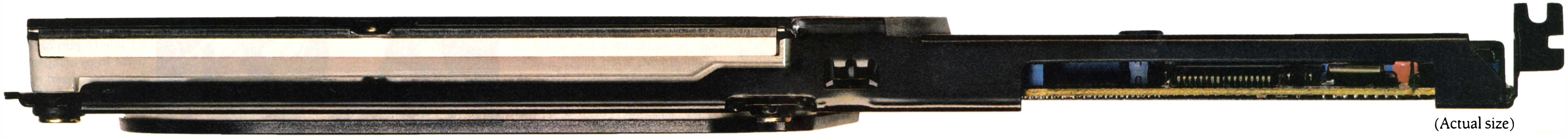
Life has become more difficult for the independent makers of enhancements for IBM's personal computers, but again, rumors of death are exaggerated. IBM has built the five most popular add-on cards into the system boards of its new line, but it also is publishing full specifications of its new system and has provided special connectors on the system board for certain types of auxiliary equipment. The new IBM systems won't need the extra memory, communications, and display features that have accounted for the majority of after-market sales and whose existence has made it practical for retailers to take a bare chassis from IBM and, by adding parts from third parties, build it into a more profitable IBM equivalent.

However, because IBM has not closed the system, enhancement makers will be able to—even encouraged to—find other shortcomings in the new computers for which they can compensate.

As usual, IBM has turned out to be both more fearsome and alluring in prospect than in actuality. Through the conventions of American journalism, which tends to present every event as combat, we are regularly treated to stories about forthcoming IBM products that will dazzle customers and devastate competitors. We read and we believe, although we know that it almost never works out quite that way. ■

Richard A. Shaffer is the editor and publisher of the COMPUTER LETTER, *a weekly industry newsletter based in New York.*

Still thin at 40.



(Actual size)

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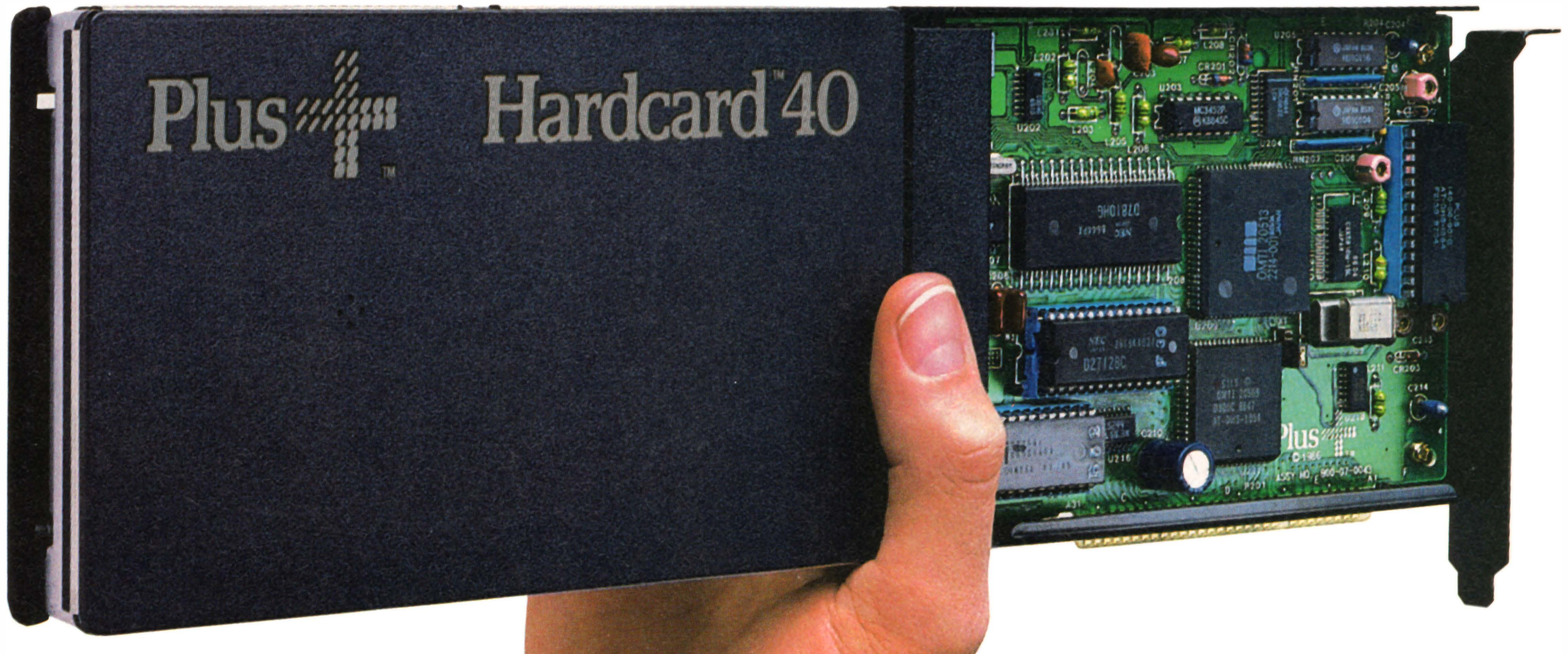

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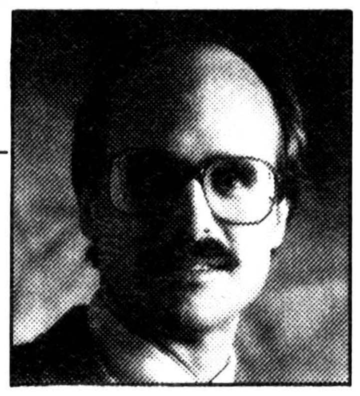
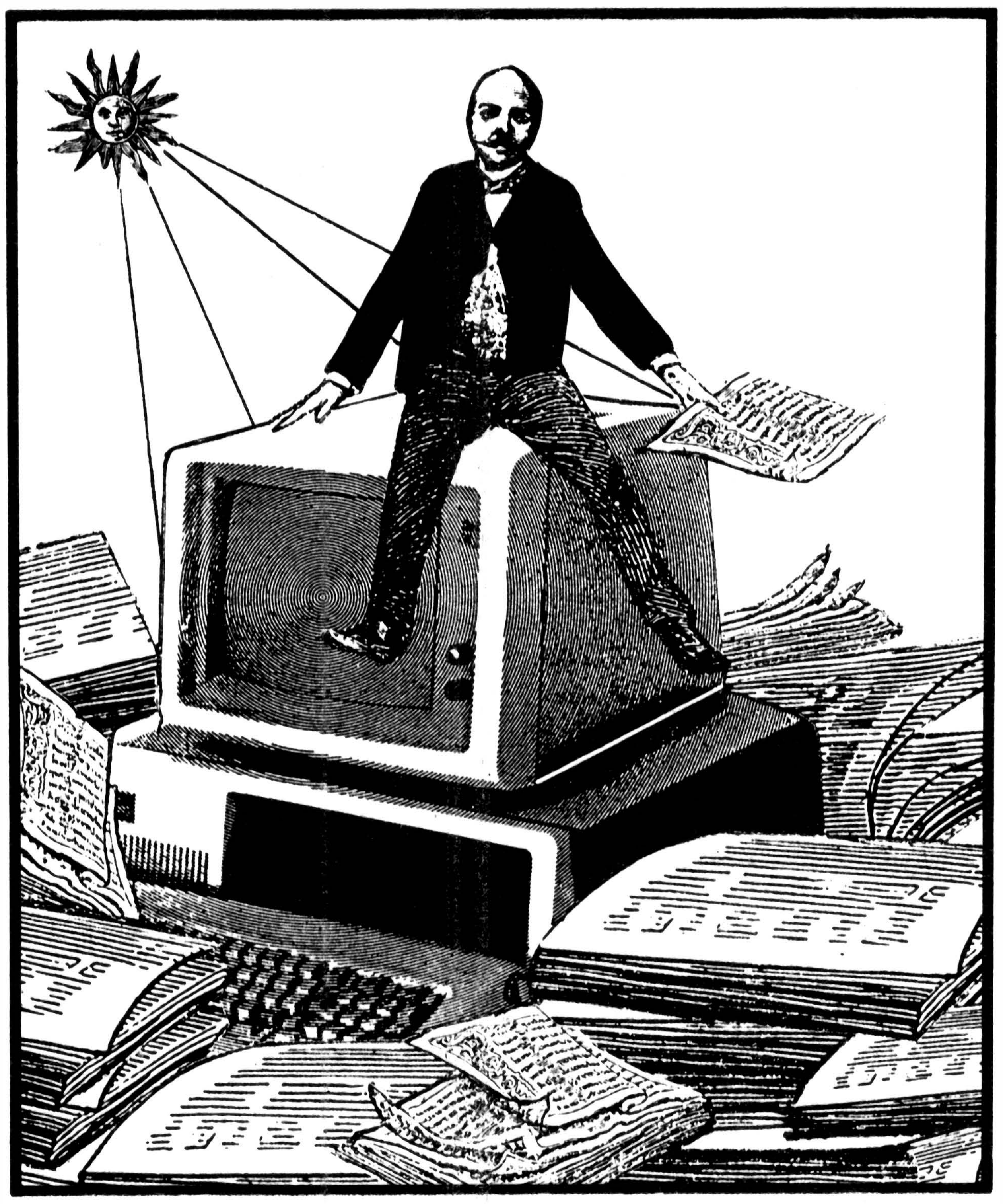


The Paper Revolution



JOAN HALL

The odd thing about paper is that we still use it. The stuff should be obsolete, a quaint, medieval, anachronism, replaced by new information technologies like the personal computer.

Yet quite the opposite has happened. Two decades into the information revolution, the corporate use of paper continues to increase at a rate twice that of the growth in the Gross National Product. Despite predictions of a paperless future, we have merely automated office
paper ge
typist once worked one sheet at a time, word processors now crank documents out of printers like bullets from a machine gun. One of Xerox's first laser printers, the Dover, is rumored to have been so named because the stacks of bond piled next to it resembled the famous white cliffs.

This curious persistence of paper in the face of new technologies belies a more important trend. Businesses use more paper because they now are using it in a new way. We think of paper as a communications medium, but it has been equally important as a means of storing information. No office is complete without a bank of file cabinets in which to entomb documents spun out of word processing systems and copiers.

This is changing. Paper as "storage" is taking a back seat to paper as "interface." Paper as interface? Paper becomes interface when users print documents to be read and not merely to be filed. Instead of collecting and carrying around reams of paper, we will print our documents on demand and discard them when done.

Desktop publishing tools further the emergence of paper as interface. In fact, desktop publishing may ultimately qualify as a user revolution precisely because it allows paper as interface.

The key to paper as interface is the availability of on-demand printing—the ability to painlessly print out a readable document in a reasonable amount of time, without flinching or shuddering over the process. It is printing without pain.

This is precisely what even the most basic laser printers offer. No need to fuss with tractor feeds or otherwise nurse the printer along. One could go away and pour a cup of coffee while the document is emerging, or work simultaneously on another project.

The laser printer amounts to nothing less than a personal bulldozer for knowledge workers. A friend, who's a novelist, printed over 1,900 pages the first week he had his LaserWriter home. Nineteen hundred pages! Another confessed to me that printing has become so painless that his machine virtually begs him to make test copies. This is a case of paper as interface.

But why should we read information on paper at all? More and more information is being stored electronically, so why not simply view it on a screen? It is estimated that more information is currently stored in digital form than is contained in all of the books in all of the libraries in the world. Electronic information is far more portable and mutable than that stored on paper, with the result that information is flying around faster than ever. It is stored and accessed, uplinked and downlinked and wired, fibered and cabled at steadily rising baud rates.

For humans to use it, electronic information must first come to rest long enough to be perceived. This above all is an interface process at which paper excels. It is fine to scan snatches of information on a computer display, but reading anything long soon becomes tiring. Screens will get sharper and more portable, but for the moment, reading a book-length document on even the best monitor is about as inviting as reading a newspaper with a pair of field glasses.

Paper holds the advantage in other ways as well. Conventional documents placed "on-line" have an unavoidable linearity not present in paper form. It is easy to flip back and forth through a book; try doing the same with a 50-page text displayed on a personal computer. And paper as interface is inexpensive, convenient, and esthetically pleasing. The same can not yet be said for text on a personal computer screen.

Of course, we will find better ways to view documents on-screen. Programs allowing the creation of simple nonlinear texts—hypertext, a term coined by visionary Ted Nelson—can be purchased today. A hypertext is an electronic document comprised of multiple internal texts, each linked to other texts, providing the reader with many choices of paths to explore. Imagine a hypertext novel with alternate interwoven story lines and several endings. Or a history hypertext that lets you explore events of interest from several perspectives.

The hypertext concept will revolutionize how we use computers. But it will be a revolution that has already occurred in print. The thesaurus on my desk is a hypertext. It has no single "beginning" or "end;" I can't imagine reading it cover to cover. I enter the thesaurus each time at a different location based on the word I am trying to escape from. Then I navigate one of a seeming infinity of paths through its references until I discover a word that satisfies me. Eventually, hy-

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Paul Saffo, a research fellow at Institute for the Future in Menlo Park, Calif., tracks new information technologies.

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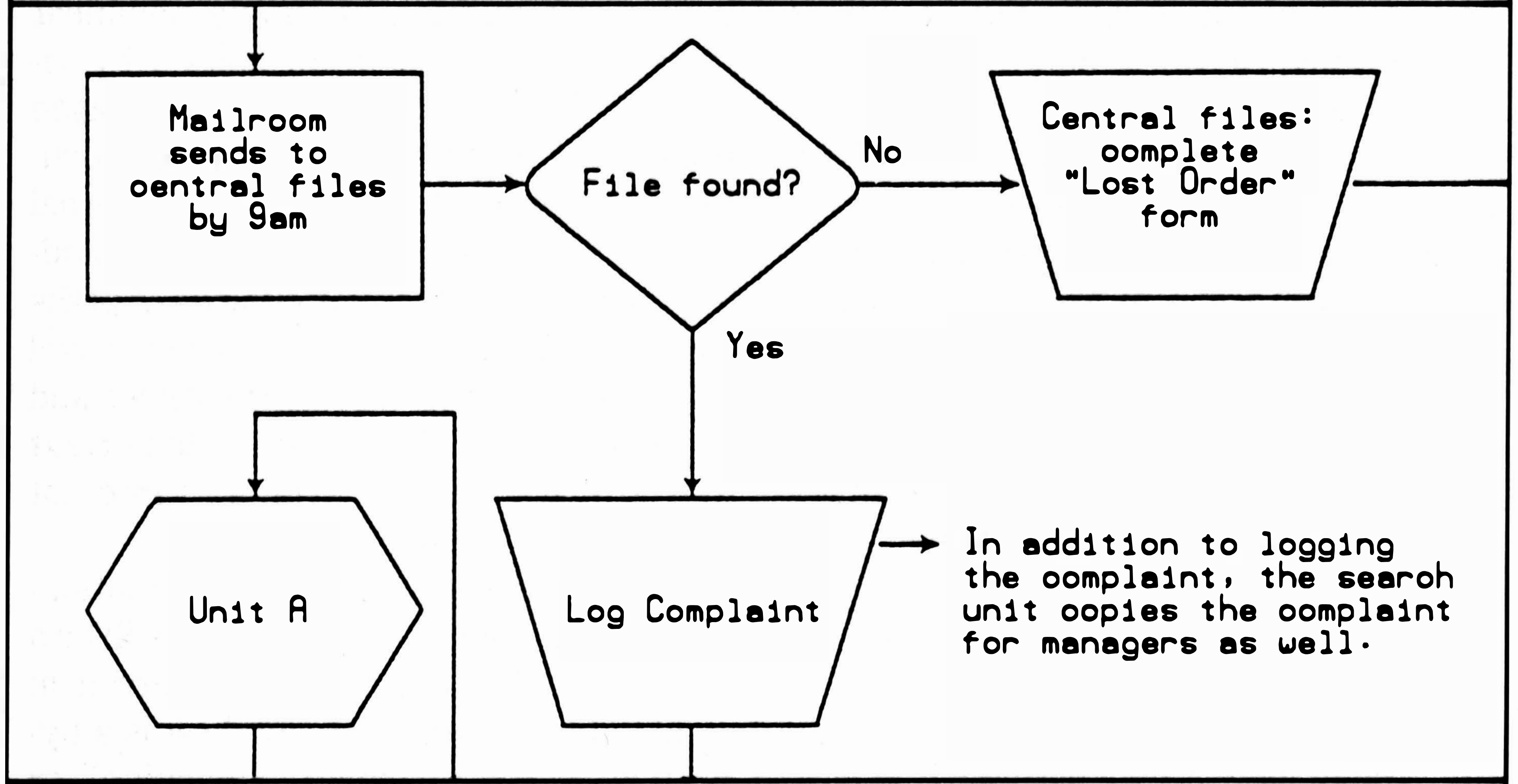
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(For More Information Circle 165)

pertext systems will yield truly novel ways of interacting with information. For the moment, though, they will do well to help computers catch up with what we can already do in paper.

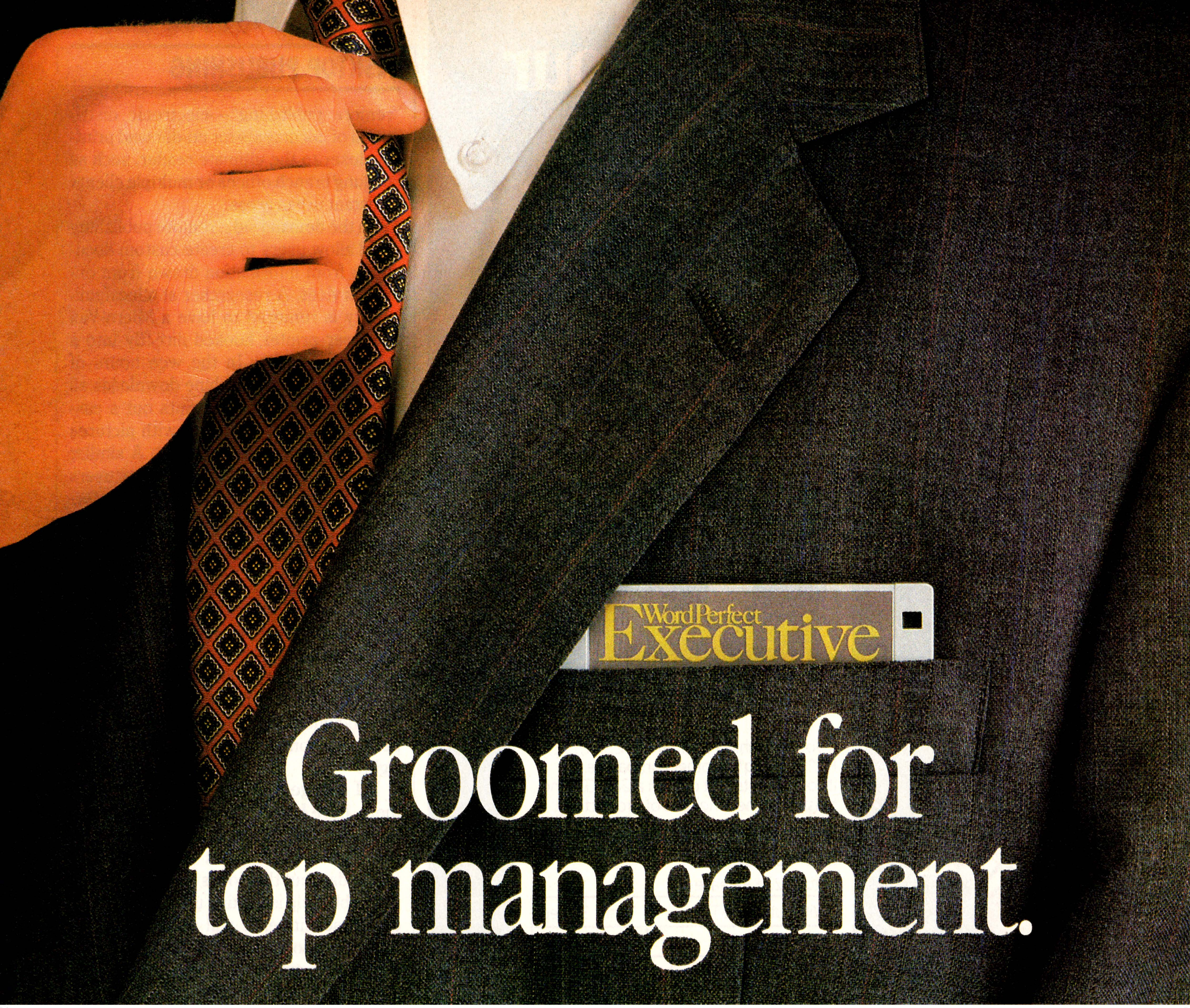
A world in which paper is interface is a world in which half of the paperless future comes to pass. We will manipulate information on personal computer workstations, store it on digital media, and read it on paper. Though this sounds like an extravagant wish, most of us are in daily contact with an example of paper as interface, the newspaper.

In their own way, newspapers represent an unseen revolution tiptoeing past unsuspecting readers. The basic format of newspapers is little changed since their size was first established as a compromise between English paper taxes (based on a page count) and the maximum sheet size that printing presses (and readers) of the time could cope with. The tax laws are forgotten and the old presses long scrapped, yet the format is unchanged. Newspaper production is now totally automated up to the moment that plates are made to run hard copy. In theory, we could scan our news on a computer screen. In practice, we prefer to read it on thin, quickly yellowing oversize sheets generally thrown out within hours of purchase. That is paper as interface.

The emergence of paper as interface creates interesting opportunities—and wrinkles—for business users. For starters, we must overcome long ingrained instincts that tell us that we must save paper. So accustomed to collecting paper, business users will increasingly be challenged to efficiently cull redundant and irrelevant documents lest they overwhelm existing paper filing systems. A compulsive filer, I am hoping for a technological fix— self-destructing paper that spontaneously decomposes after a certain interval. Instead of 60-weight bond, I will purchase 60-day bond, and use the fuzz left in my file cabinet for compost.

It will be some time before there are electronic filing systems capable of replacing paper files entirely. Until then, users will prefer to rely upon an amalgam of electronic and paper storage. This will further complicate the disposal problem. It is hard enough to delete a file when I know a printout safely resides in a folder down the hall; the thought that I might be sending the only copy of something into electronic oblivion paralyzes me.

On a brighter note, viewing paper as interface may also suggest new business publishing opportunities. For example,



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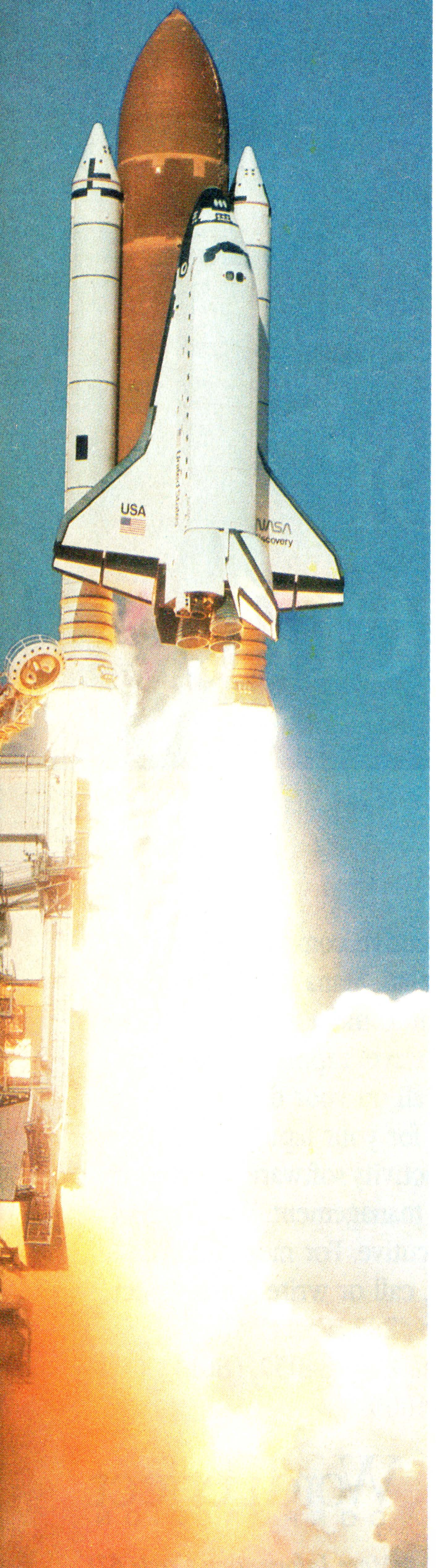

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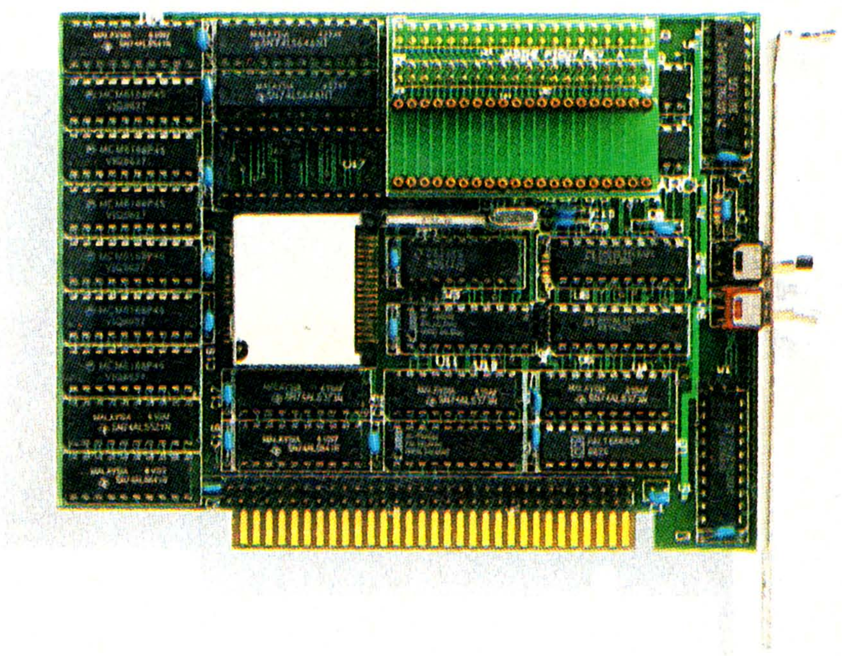

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(For More Information Circle 195)

"remote publishing"—electronic distribution of documents for on-demand printing closer to the ultimate reader, such as far-flung branch offices or multiple clients in distant urban areas.

On the demand side, remote publishing could allow users to create custom documents from information drawn from online services. A researcher at a local university is rumored to have a Micro-Vax and laser printer hooked directly into a major press wire. In the wee hours of each morning, his machine downloads all stories of interest and prints out a customized "paper" complete with pictures for his perusal over breakfast. A similar system could be used by corporate users to collect and publish time-critical external information; say, all wire stories mentioning their company or a competitor.

Recognition of paper as interface also will affect long-held assumptions about the document production process. The notion of what constitutes an "original" will prove increasingly elusive. Is it the first electronic version of a document, or are each of multiple paper variations originals in their own right?

If I change only the format of a document, have I created a distinct original, or must the text be changed as well? We place greater emphasis on textual content today, but that too is changing. Desktop publishing is making us all much more design-sensitive. It will not be long before the majority of users consider a document's layout to be as important in defining a document as its textual content.

Even the notion of authorship is in for change. A researcher who uses his or her system to extract and assemble on-line information into a custom paper is as much an author as the individuals who wrote the pieces gathered. A reader who prints out only portions of a larger document he wishes to read acts much like an editor. In businesses, blurring the notion of authorship will make it harder to assign individual credit—and responsibility—for new ideas and decisions. Innovation may become harder to reward, and wrongdoing harder to stop.

The change will go even deeper than authorship. Ultimately, paper will come to represent something very different than it represents today. Once certain and final, ink on paper will seem only slightly less transient than electrons dancing on a phosphor screen. We will have to seek permanency elsewhere, but where I cannot guess. Buy stock in paper mills. And, oh, get another file cabinet. ■

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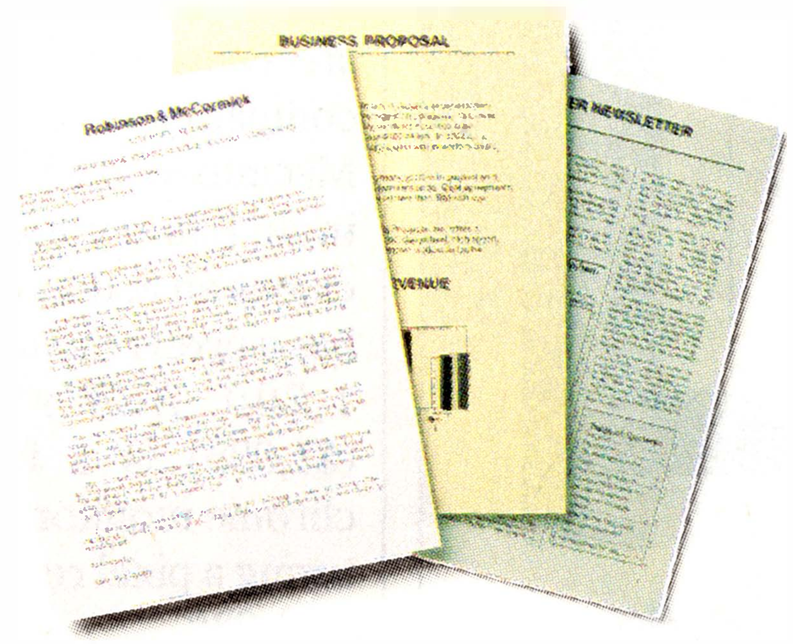

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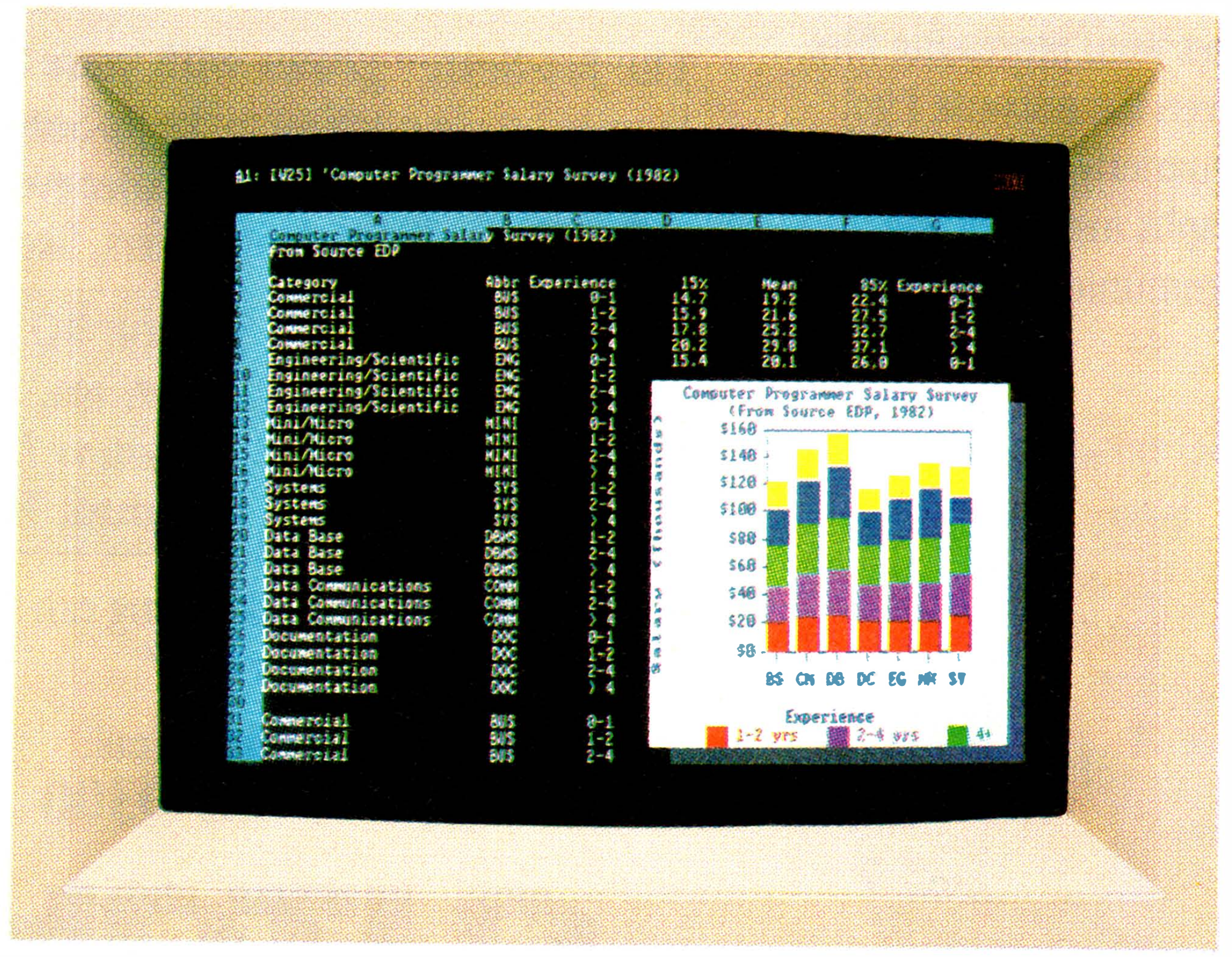

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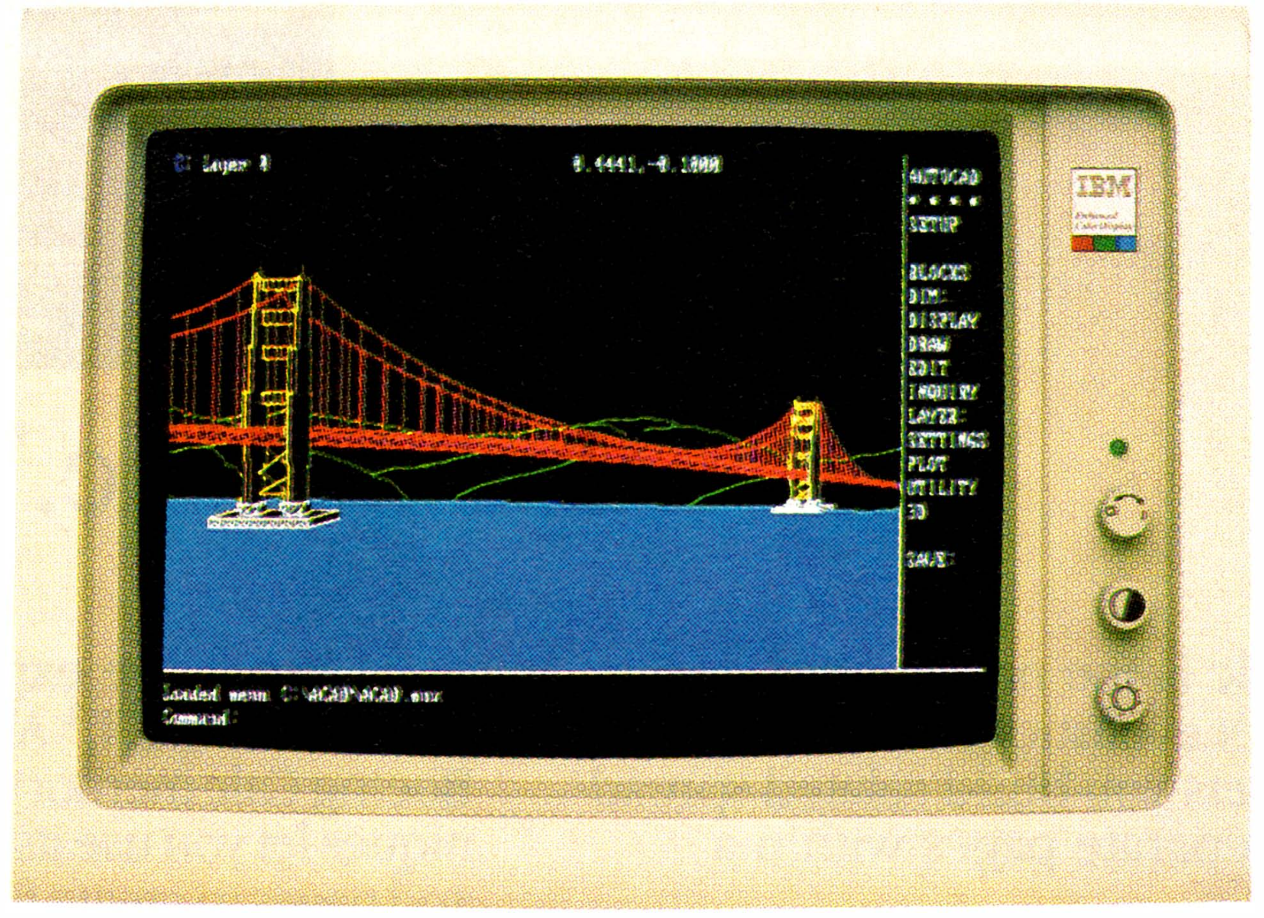

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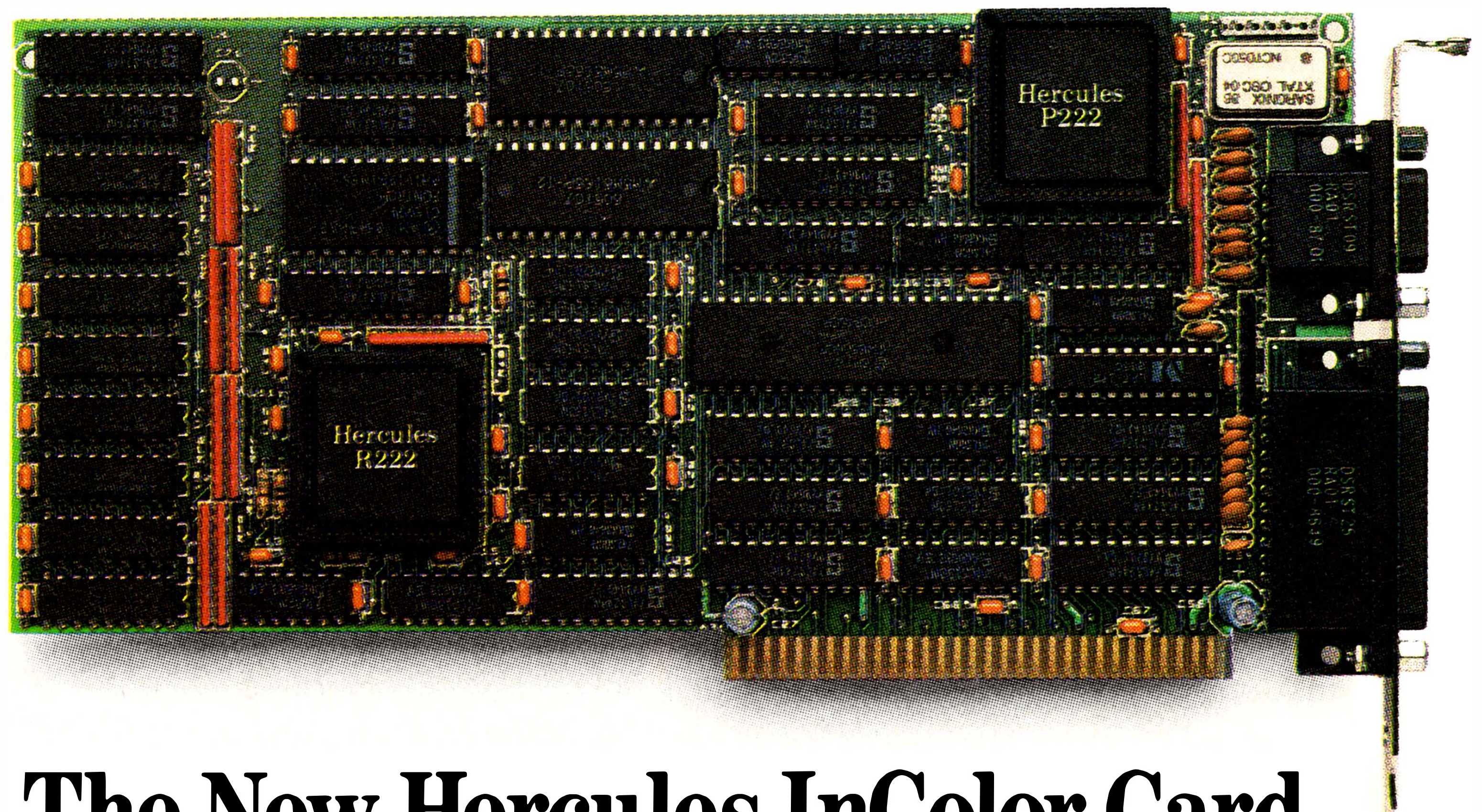

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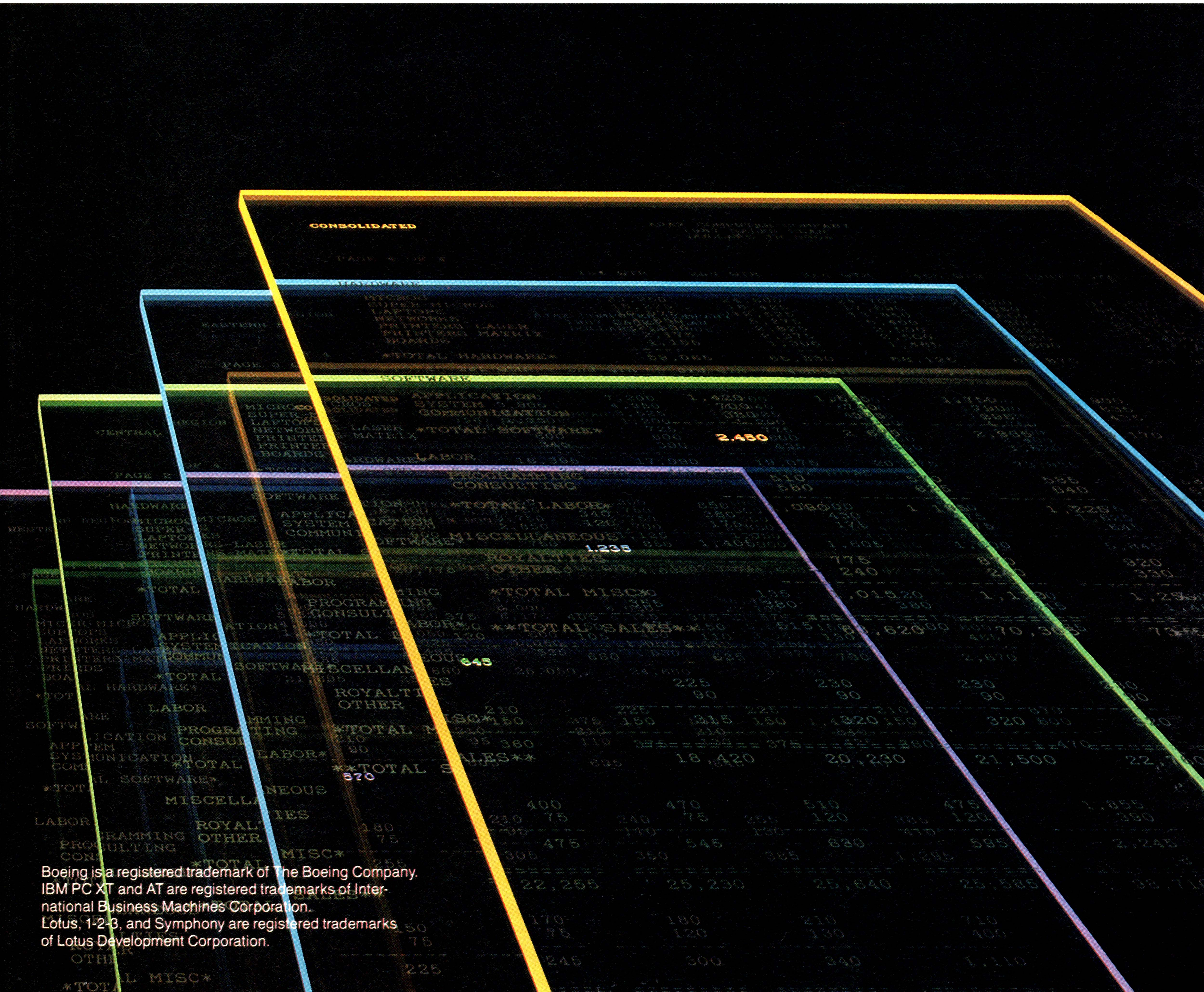

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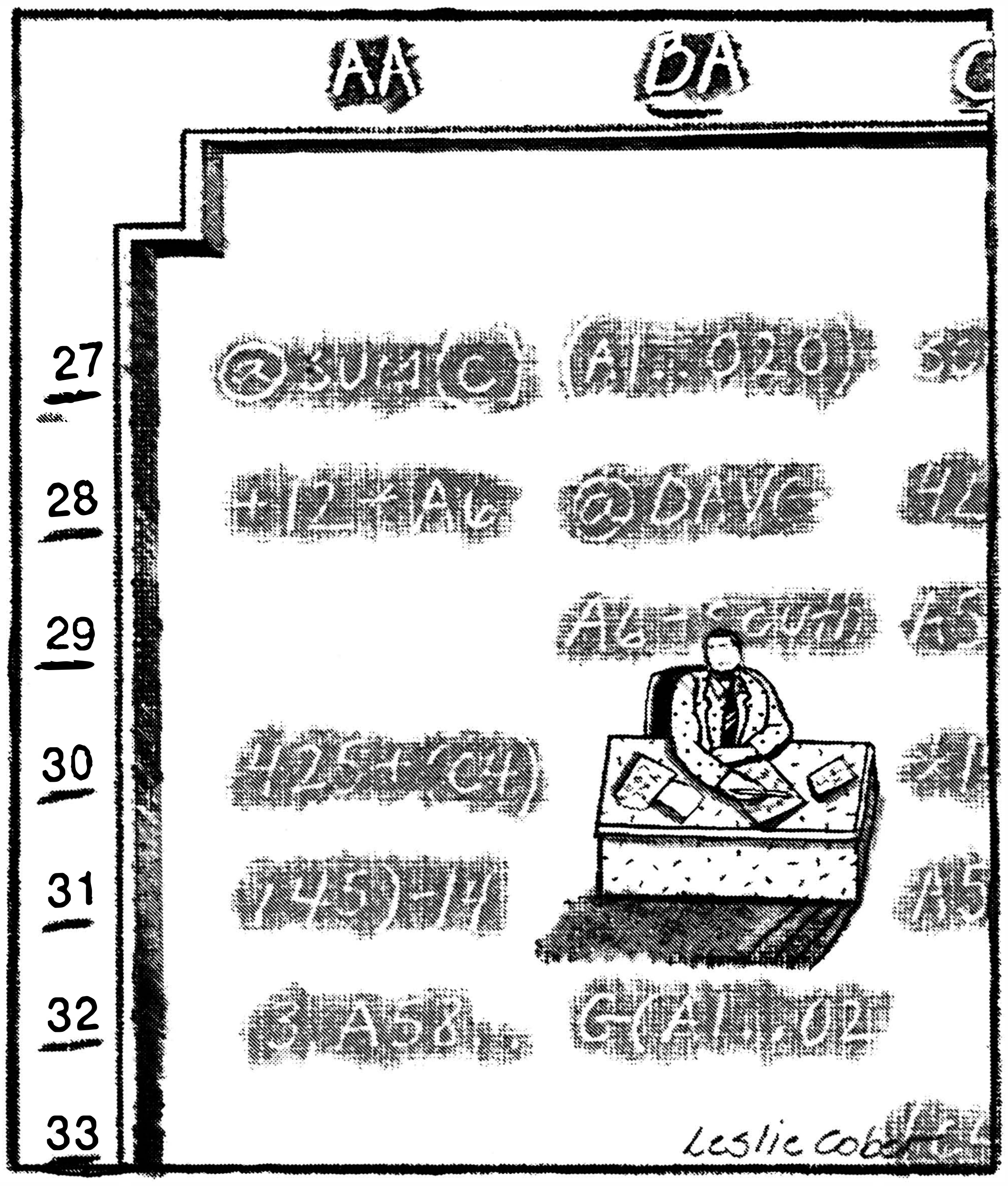
SPREADSHEETS / Michael Antonoff

Writing In A Spreadsheet



LESLIE COBER

Word processing was never meant to be conducted within the confines of a spreadsheet. But business people spend so much time inside their worksheets that the ability to dash off a quick letter or memo—particularly one that's tied to the figures derived from the spreadsheet—makes perfect sense.

Terminate-and-stay-resident (TSR) programs like SideKick and Metro have been an option. You can pop up a simple text editor, even paste in a table from the spreadsheet, and save it as a separate file. Cell annotators like Note-It and SmartNotes let you wrap a limited number of words in tiny files attached directly to particular spreadsheet cells.

The trouble with both TSRs and annotators is that they are not dynamically linked to data in the worksheet. They are fine for producing a snapshot report or making notes about archival data—but not for use with changing data. If a week, a month, or a quarter goes by and you revise the spreadsheet, the data in the TSR and note files will remain yesterday's news. To update the memo or report, you'll have to go in and scrutinize the text, then make the necessary insertions and deletions. That means more work.

With an "add-in manager," now available on Lotus 1-2-3's release 2, users can satisfy most of their word processing needs without ever leaving a spreadsheet. And recently, three add-in word processing products have been introduced that tie directly into the 1-2-3 programming code: 4Word from Turner Hall Publishing, Cupertino, Calif.; Write-In from Blossom Software Corp., Cambridge, Mass.; and InWord from Funk Software, Cambridge, Mass.

All three enable you to link ranges and cells in the worksheet to other documents. That link can be a real timesaver, for example, in the case of a weekly or monthly sales report based on figures that are in flux. When the numbers in the spreadsheet change, linked numbers in the document can be updated with a simple command. You don't have to retype them. All three programs also enable you to merge a mailing list of names and addresses with a document. Thus, the most current sales figures in the spreadsheet could be linked to a report containing an introduction, analysis, and a conclusion; then a personally addressed copy could be sent to everyone who needs to see the report.

Though all three programs allow you to wrap words, 4Word is notably different from the other two in storing documents within the actual spreadsheet columns. Consequently, it is the only program of the three that will produce a document directly within the spreadsheet's columns, eliminating cut-and-paste procedures. Write-In and InWrite save documents in separate files.

But because 4Word is stored within the columns, the program forces you to abandon a basic tenet of computing, i.e., save first, then exit. Since 4Word has no file commands of its own (it relies entirely on the file retrieve, save, and print utilities of the spreadsheet), you escape from the word processing environment first, and then you save.

Before you start to write anything on 4Word, you should make certain that the text won't run into a numerical section of the spreadsheet. 4Word doesn't overwrite data but it does push it down. In cases where that occurs, 4Word may wreak sufficient havoc that you have to rewrite formulas or place the text elsewhere so the spreadsheet numbers can be returned to their original locations. Once you move affected data back to where it belongs, you'll still see zeros instead of totals. It is at this point you need to press 1-2-3's F-9 recalc button to restore all of your original calculations.

Because of this, users of 4Word tend to cursor right a few columns to an empty column—a clean slate—in their spreadsheets, hit Alt-F9 to pop up the 4Word environment, and then start writing a memo or accompanying report. Otherwise, the inserted text may push other data where you don't want it.

A modicum of discipline is important when storing a 4Word document. You must be very conscious of where you save a file. With a standard word processor, you usually save every letter or memo in its own file; you don't even think about how something is saved, beyond naming it "Memo1" or "Bossrept." With 4Word, though, you may end up parking a document in any one of 2,098,432 spaces (that's 8,197 rows times 256 columns). Better remember where you put it or you'll do a lot of scrolling through the spreadsheet to find your work.

Also, this isn't MultiMate or Manuscript, with summary screens to tell you what a file is about and who created it. Nor can you count on the DOS directory date and time. These only indicate when you saved the entire worksheet.

Since a 4Word document is normally part of a larger worksheet, you must decide ahead of time whether you want to create the document in a separate worksheet. The advantages of segregating the document in its own file is that you'll be able to find it more easily or print it without having to anchor and point to its range within the larger worksheet. The well-organized person, however, will save the document separately only if it's divorced from potential revisions to the worksheet. If there's a table of numbers in the document that derives from worksheet calculations, and those figures are revised weekly or quarterly, you will want to leave the document in the larger worksheet in order to use its linking capability.

One function that word processing offers that spreadsheets do not is search and replace. This feature becomes particularly handy when you are using a spreadsheet as a data base and decide to correct misspelled labels or bad punctuation in a column at the same time. You have to make sure that the column width in the word processor matches that of the spreadsheet column, or you may find your rows have arranged themselves out of kilter when 4Word realigns the text.

Printing, like file commands, is handled from the spreadsheet. When you consider how intrinsic printing is to word processing, the idea of giving control to the spreadsheet seems a little alien at first. Print ranges and "printer-go" commands are executed from 1-2-3's slash-key and print option menu. Because 4Word has no printer drivers of its own, the quality and variety of your output is no better or worse than what you get when printing out the spreadsheet. The only difference is that instead of seeing narrow columns of numbers, you'll get page-wide columns of text.

InWord from Funk Software does provide its own printer drivers and character-width tables. If you've installed the program for one of the Hewlett-Packard LaserJet's proportional font cartridges, for example, you'll see the actual line breaks on-screen. So, for instance, a line with many "w"s will break sooner than a line of many "i"s. Similarly, InWord lets you indicate a headline font. Because the characters are larger, you'll get fewer words across the screen than on a line of regular text. What distinguishes the program from the others is its more extensive formatting commands.

Write-In from Blossom Software distinguishes itself from the other two by enabling you to print out text and graphs in the same document. You could, in fact, insert up to 10 graphs on the same page. You might have trouble reading the labels, though, when you have that many graphs on the same page, since 1-2-3's graphics program doesn't give you much control over graph esthetics. A spokesman for Funk, by the way, says that Inset, a RAM-resident program from Inset Systems/American Programmers Guild in Danbury, Conn., will work with InWord if you anticipate needing to insert graphs.

You may want to continue writing a document started in a spreadsheet in a regular word processor. While a spreadsheet add-in is adequate for many needs, some of the fancier operations like indexing and gener-

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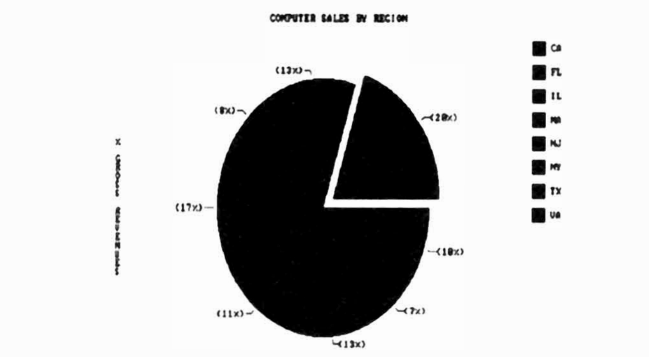

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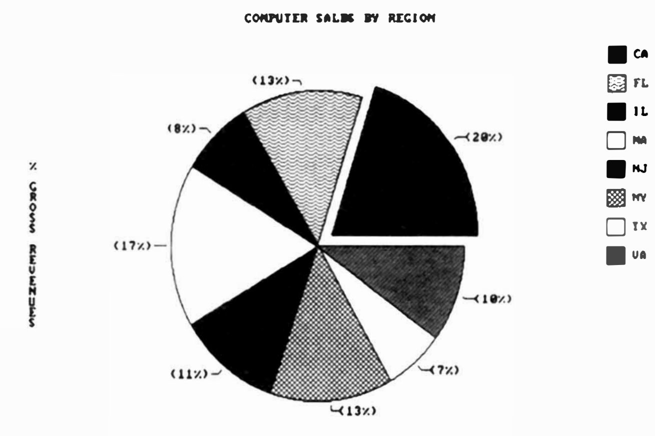

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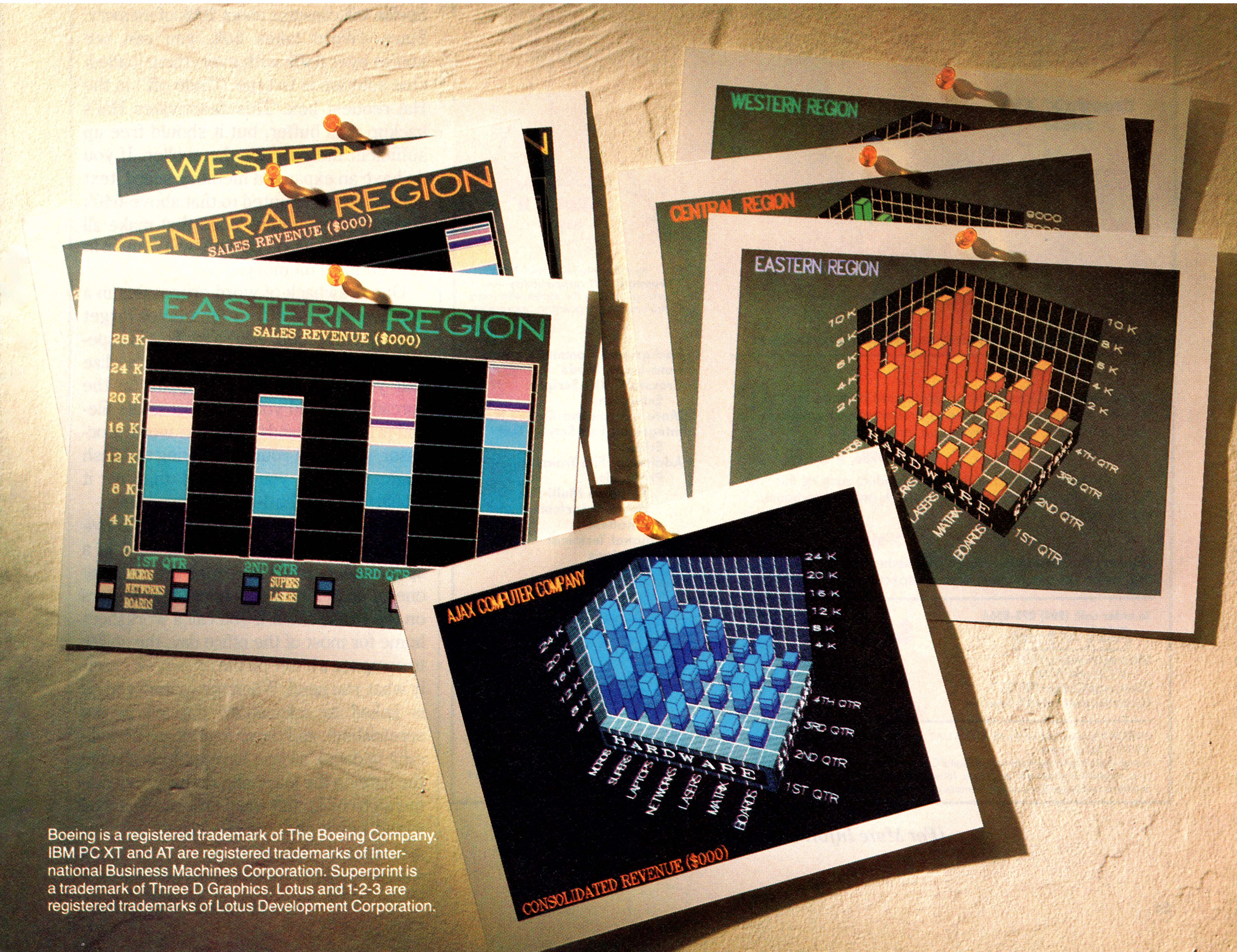
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ating a table of contents are not possible. Also, unless you have expanded memory or have properly configured the add-in word processor to buffer a certain amount of data before spilling onto a disk, you may get a "memory full" message with a long document. Most dedicated word processors, on the other hand, spill data to the disk as a matter of course.

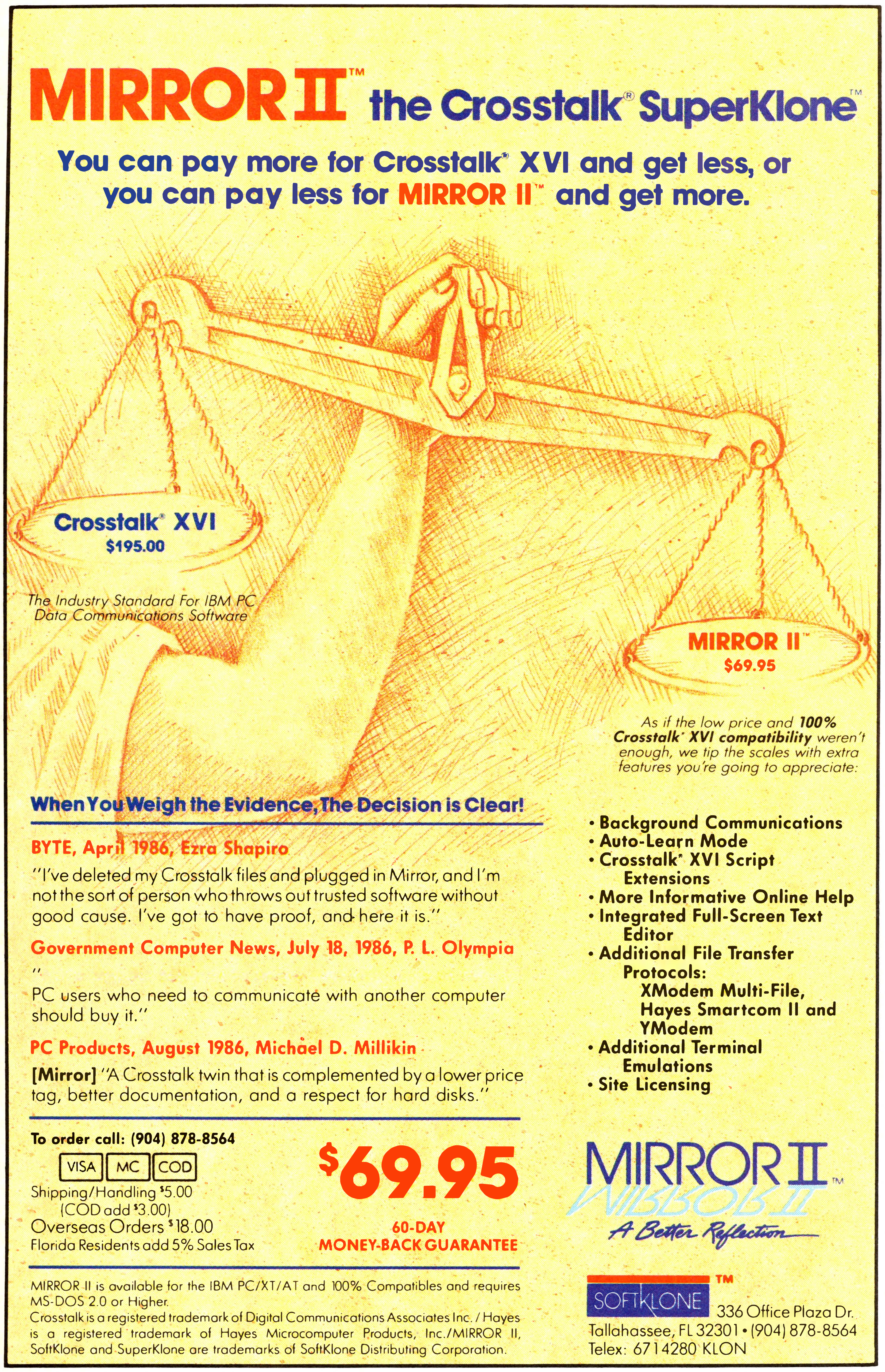
The way to move a document written in a spreadsheet into another word processor is by creating ASCII text. You do this the same way as you would with any spreadsheet—by printing to disk. You'll want to set only the range containing the document, and give it a unique file name. Lotus 1-2-3 puts a ".PRN" extension on the end of files that are printed to disk. You'll lose print enhancements like boldface and underlining when printing to disk, but at least you won't have to retype the document.

Another reason for moving text into a stand-alone word processor is to take advantage of the program's built-in thesaurus and spell-checking features. With Write-In and InWord, you're dependent on RAM-resident add-ons like Borland's Turbo Lightning to offer synonyms and to correct misspellings. Turner Hall, which publishes 4Word, was planning to make Spellin, an add-in spelling checker, available around the end of June or early July. The program, which is being developed by Borland International, will supposedly check all the labels in the cells of a 1-2-3 or Symphony spreadsheet. (4Word text is treated by 1-2-3 as labels). According to a spokesman for Turner-Hall, Spellin will not work with Write-In or InWord because their files are not stored in the spreadsheet, but rather in a separate file.

Keep in mind that if you're running Hal, 1-2-3's English-language shell, you've already exhausted 512k. Spellin will consume about 100k of memory. Since 4Word takes 60k, you can see you're over 640k with everything loaded. One solution is to type "Undo off" in the Hal request box. This deactivates Hal's backup data buffer, but it should free up sufficient memory for the speller. If you do have an expanded memory board, text and labels are shunted to that above-640k space. The program codes that make all this software work, though, will remain in conventional memory.

One drawback of word processing in a spreadsheet is that you sometimes forget which environment you're in. This is especially true with 4Word. Until you realize that you can't do word wrapping in the spreadsheet, and you can't access the file-and-print commands from the word processor, you'll find yourself deleting the slash mark, the key you pressed thinking it would bring up the 1-2-3 command line.

If word processing is your major activity, there's very little reason to do it in a spreadsheet. You'd be better off with any one of scores of independent text editors on the market. But if you call a worksheet home for most of the office day, the ability to compose a letter on the fly may be exactly what you need. When the writing you do is linked to calculations derived in the spreadsheet, and those figures are periodically updated, all you have to do is change the date on the letter and revise your comments to make the word processing a vital—and nearly automatic—adjunct to your spreadsheet application. ■



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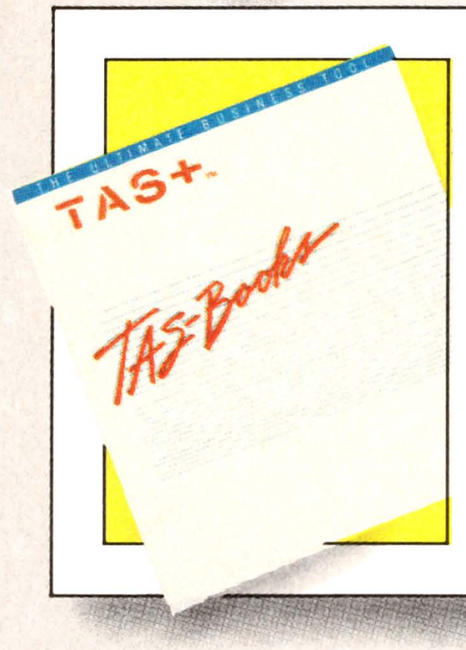

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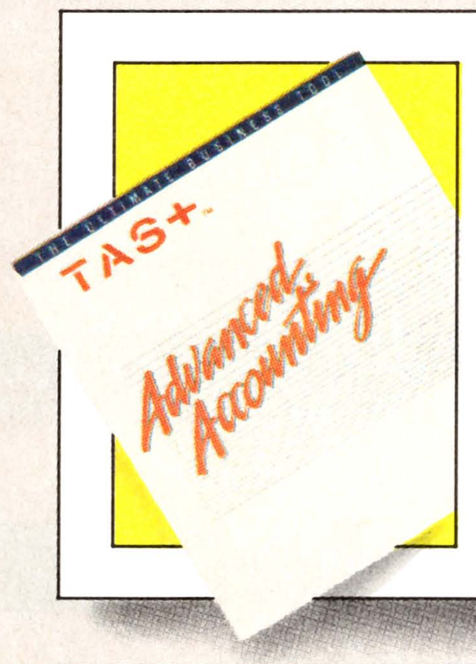

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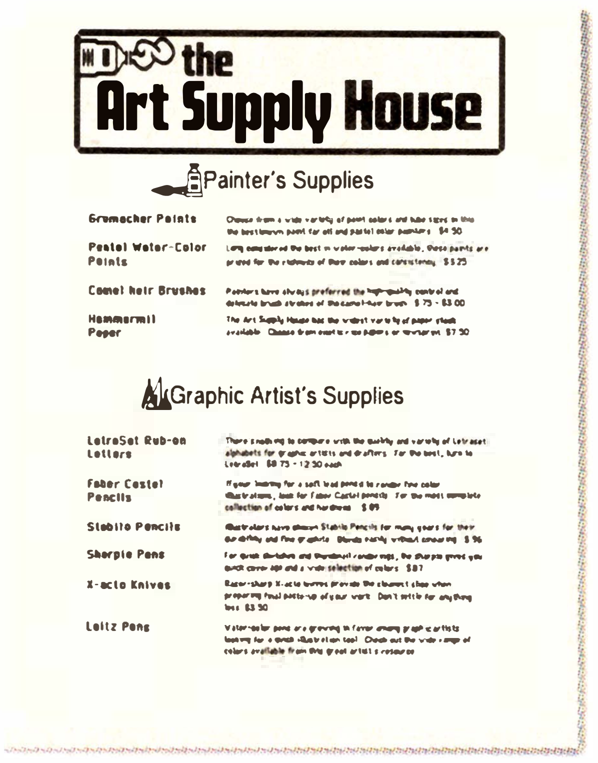

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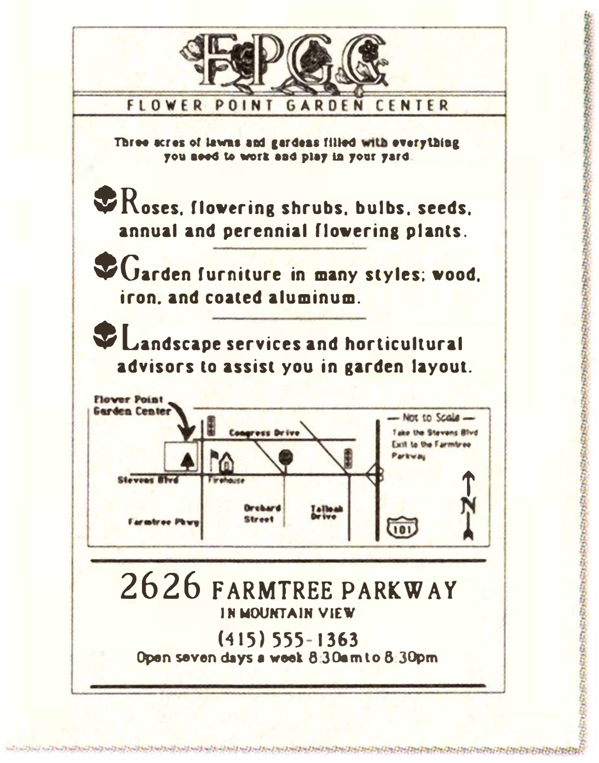

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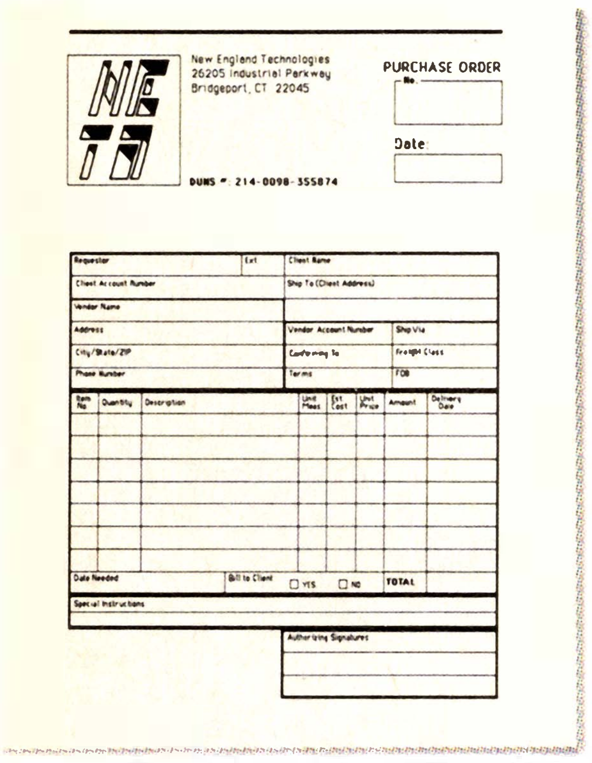

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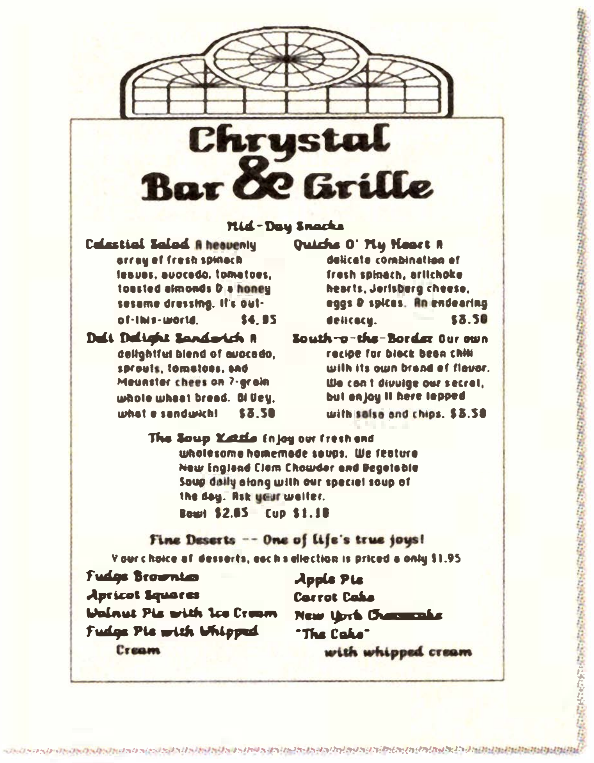

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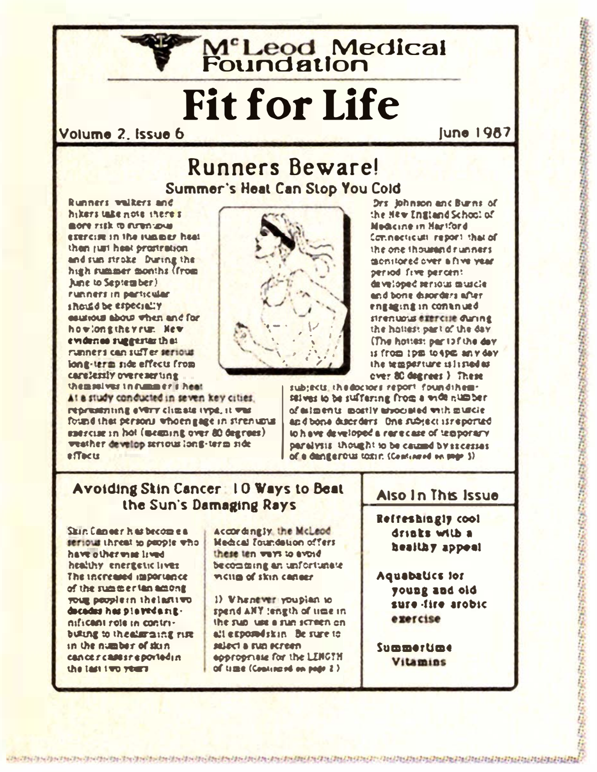

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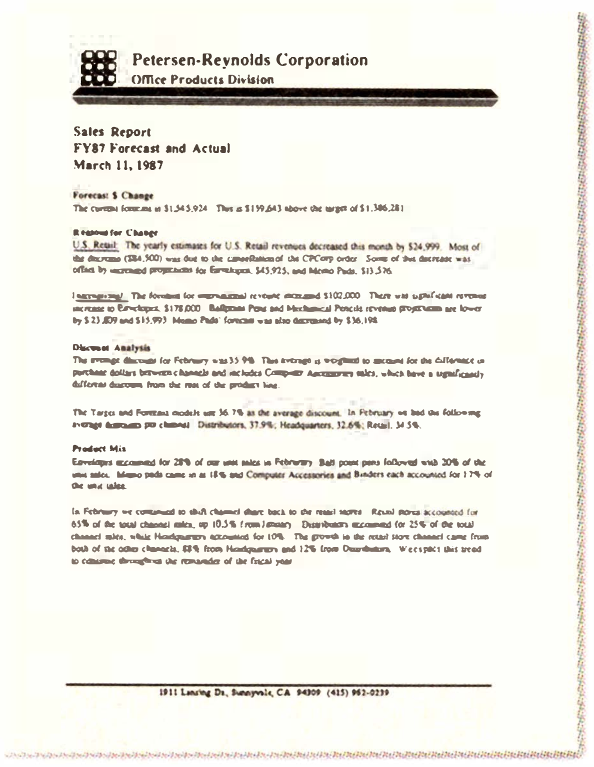

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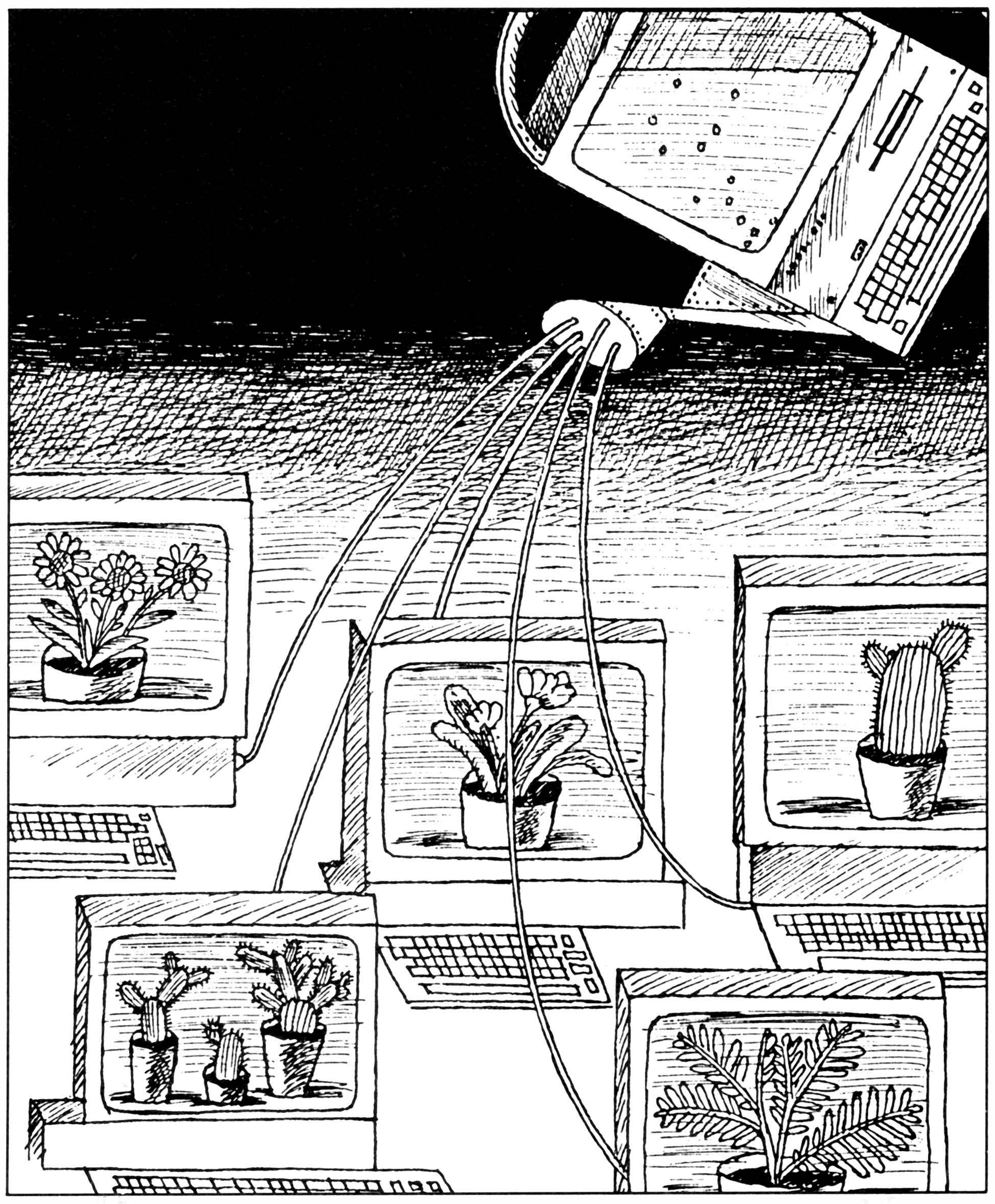
'Diskless' Computing



DEVIS GREBU

One of the hallmarks of personal computer networks is flexibility. Because their development was influenced by the need to connect existing machines more conveniently, personal computer networks can accommodate a wide variety of workstations. A local area network might bring together such diverse systems as IBM PCs and Apple Macintoshes; and, even in an "IBM-only" network, it is not uncommon to find ATs, XTs, PCs, and compatibles in a variety of combinations.

A networking option that is growing in popularity is the "diskless PC" or the "diskless workstation." (The terms describe a computer that has no local disk drives and can therefore be used only as a workstation.) The user of a diskless PC must load and run programs from a shared drive (usually a hard disk in the file server) and store all of his or her data on the network hard disk as well.

In every other respect, however, the diskless workstation is a functional computer, complete with a microprocessor, random access memory, a keyboard, a display screen, and a video display adapter. If a workstation generates a high volume of printed output—especially in a network spanning relatively large distances—it may be equipped with a local printer or plotter. This reduces the drain on shared resources and spares the user repeated trips to the network printer(s) to pick up output.

Saving money is one reason for diskless workstations. If there is no need for local disk storage, a company buying a number of MS-DOS personal computers can realize substantial savings by eliminating many of the disk drives. Apart from the initial savings, a company might reasonably expect to spend less money for repairs and maintenance since a computer's mechanical assemblies are more likely to fail than its electronic components. Even with normal use, disk drives will require some periodic maintenance—at the very least, cleaning, but often realignment as well.

But cost, important as it may be, is not the primary attraction of the diskless workstation. Two more important aspects are control over network usage and data security.

Diskless workstations allow management to maintain a tight control over what each employee can do. When a user is logged onto a LAN that makes full use of the network software's security system, the passwords and access privileges established by the network administrator determine which software can be run, which disk drives or subdirectories are accessible, and even what types of access—"read-only" or "read-write" for example—are permitted.

In contrast, if each network node is a computer with its own disk drives, there is no way to prevent a user from booting up DOS from a floppy and running any available applications software. Such freedom makes it easier to copy software illegally, manipulate data downloaded from the network in ways not sanctioned by management, make changes locally to shared data that other users on the network are not aware of, and use the computer and software for personal applications.

Although diskless workstations may enhance data security, the absence of local floppy disk drives cannot guarantee that information will not be copied or removed from the premises. Any user with a printer can generate a hard copy of a given screen image, while users with permission to print a particular record could try to carry a copy out of the building. Still, a computer printout is larger and harder to conceal than a floppy disk, and its contents more identifiable. To inspect floppy disks, a corporate security station would have to be equipped with a computer and also be staffed by computer-literate guards.

The first diskless personal computers were created by simply removing the disk drives from computers already in use. If these drives were good enough to be kept as spares or installed in other stand-alone machines that had only one floppy disk drive, so much the better.

Now, however, with a plethora of inexpensive hard disks available, the single-drive personal computer has virtually disappeared from the marketplace, and the two-drive alternative is rapidly losing ground. Since most software can be configured to run on a hard disk, it is rarely necessary to have two floppy drives in a system that incorporates a hard disk. Given these developments, buying a new computer and then removing a perfectly good floppy disk drive now seems like a waste of money.

For a company wishing to purchase diskless personal computers, then, there are several alternatives. Most "name-brand" IBM-compatibles, such as those made by Compaq, Epson, Kaypro, and Tandy, still come with at least one disk drive, but any of the dealers who structure "generic" or "house-brand" clones can put together a system with the right combination of disk drives, memory, display options, and I/O ports to suit any requirements—even the requirement for a

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Miriam Liskin, a Berkeley, Calif., writer and consultant, is the author of ADVANCED dBASE III: PROGRAMMING AND TECHNIQUES.

computer with no floppy drive.

In addition, several manufacturers are introducing computers intended specifically for use as diskless workstations. 3Com, for example, offers a diskless 80286-based machine with up to 4 megabytes of RAM, EGA-compatible graphics, a built-in 3Com network interface, and serial and parallel ports. Since it doesn't have to support any disk drives, the system can be relatively small; it needs only a 25-watt power supply, which offers the benefit of making it quieter than most personal computers.

A company considering the installation of a diskless computer network should try and determine whether a network will best suit its needs. A multiuser supermicro may be more appropriate, or even a small minicomputer that might cost less and yet allow greater control over data access and security, since each workstation would consist of only a terminal and a keyboard.

In some situations, primarily those of companies running dedicated vertical applications, a multiuser system would be the best choice, provided that the necessary software is available. In applications such as point-of-sale and warehouse or inventory control, for example, there might not be a need for anything but a keyboard and a display screen and perhaps a printer at some of the workstations. These terminals would be used for data entry and inquiry into a set of common data bases.

In a company with more diverse or less clearly defined requirements, the multiuser solution is not so appealing. With one computer serving the processing needs of all the terminals, performance may suffer more than it would in a busy network where each individual workstation comes equipped with its own processor and memory.

Furthermore, a network offers greater flexibility for combining different systems and for adapting the configuration to suit changing requirements. A typical network might include AT-class systems, XT-class systems, PCs with floppy disk drives, and diskless PCs; and the number, location, and purpose of these machines could be changed at any time. Unlike a terminal, a computer could even be upgraded by adding a hard disk, or converted to a stand-alone system (provided, of course, that it was designed for stand-alone use; a special-purpose diskless computer with a small power supply is unlikely to be upgradable).

The diskless workstation is not the solution to every company's networking problems. Some obvious problems of a diskless computer network are related to copy-protection and software-licensing agreements. A program with a copy-protection scheme that checks for a key disk inserted in the floppy drive will not run on a diskless machine. Nor will software that either cannot run on a network or that has a licensing agreement forbidding installation on a LAN.

All of these problems are diminishing in importance as more and more software companies drop copy-protection, adopt methods and/or policies that permit hard disk installation, and offer site licenses or network versions of their programs. However, some of these software "solu-

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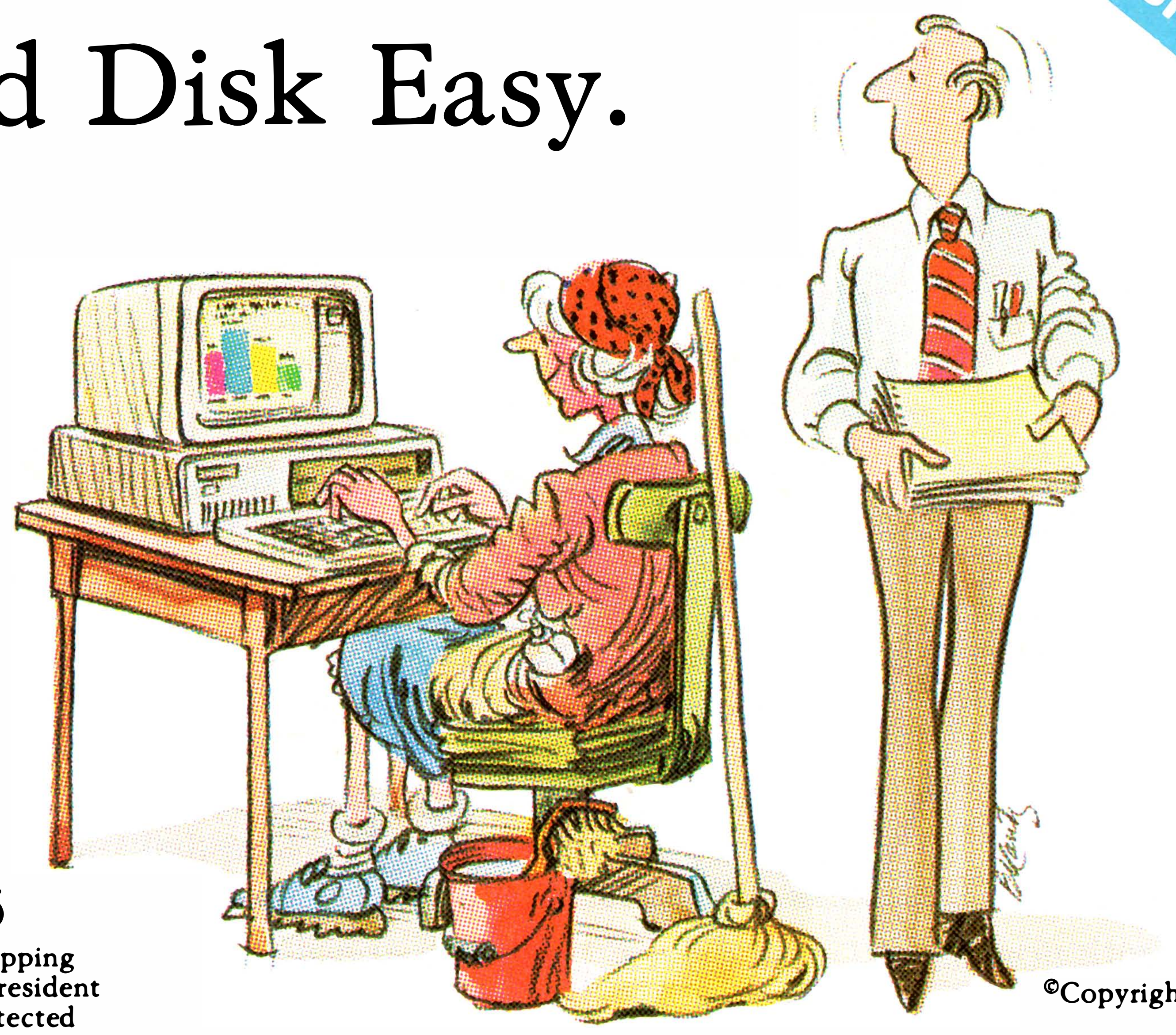

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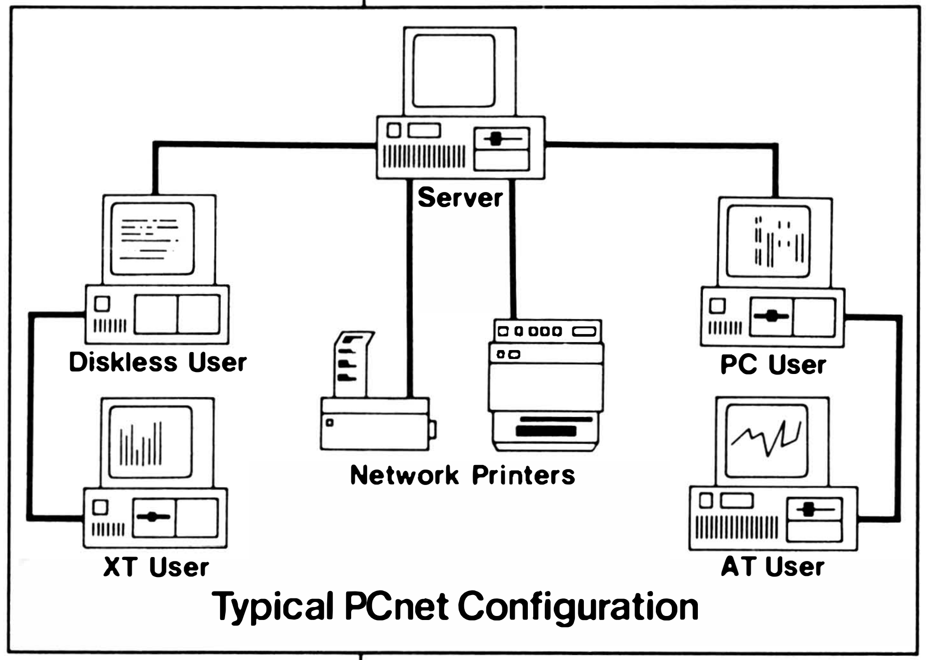

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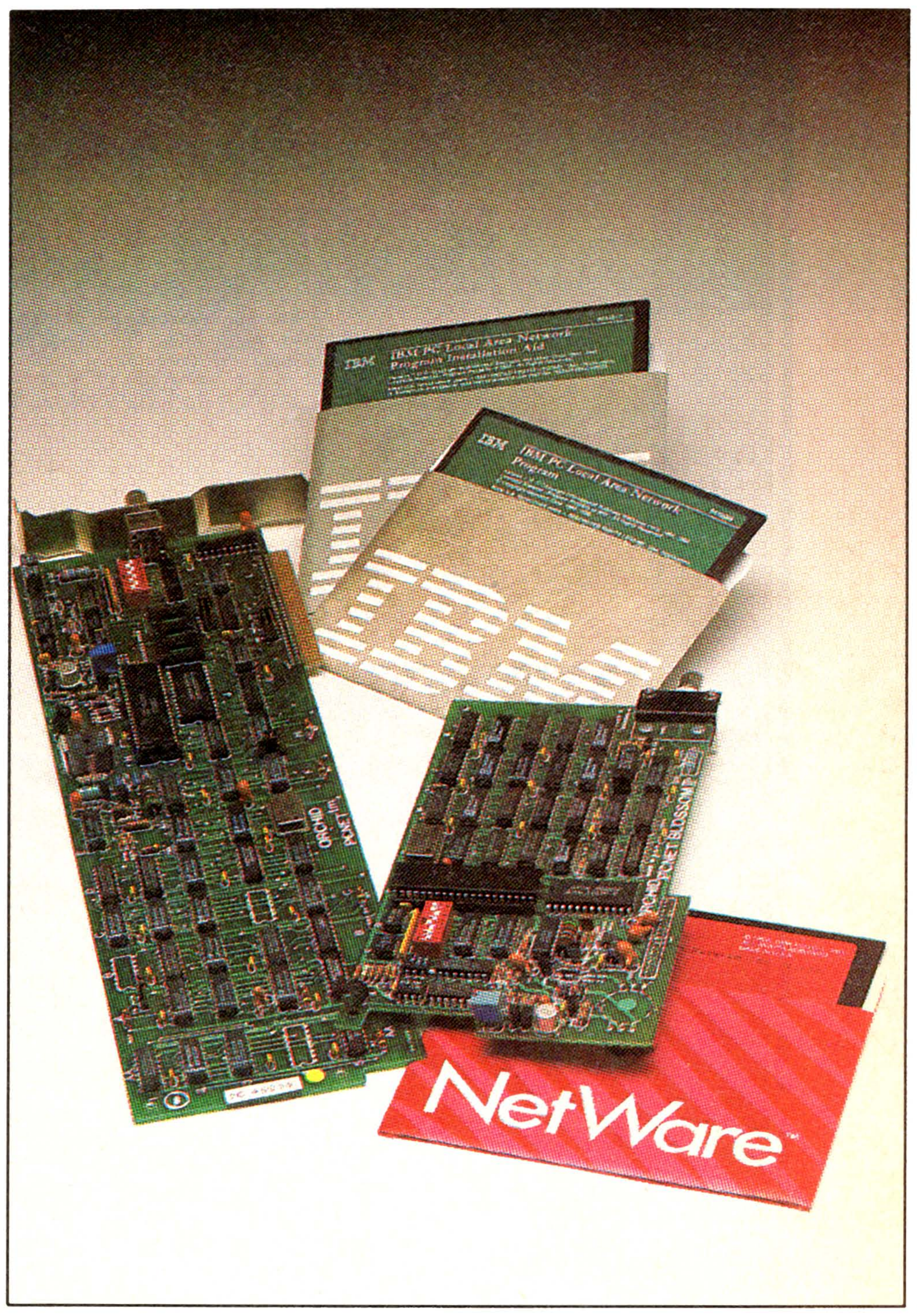

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tions" may turn out to be more costly than disk drives. For example, a company might have to purchase the more expensive network version of a particular program even if only one user needed it if that user's computer could not boot from its own disk drive.

The fact that diskless workstations must always be connected to a network can exact a heavy toll on performance. Each workstation is affected by other activities on the network and, in turn, constitutes a drain on the system's shared resources. All disk-access requests must compete with those of other users. Obviously, delay and frustration are possible with a setup like this.

Even worse, with many networks there is a noticeable drop in performance for each user who logs on, even if most workstations are carrying out processor-intensive (i.e., local) rather than disk-intensive operations. In many cases, acceptable performance can be achieved only with a dedicated file server with an 80286 or 80386 microprocessor and a fast hard disk, and as many PC AT-class rather than PC XT-class personal computers as possible.

Currently, one of the least expensive strategies for optimizing network performance is to educate users to log on only for accessing shared peripherals, software, or data files. If each LAN workstation is a fully functional computer that can boot DOS locally, a user does not have to tie up network resources or degrade the performance of the entire system when there is no need for common resources. Where several users need the same word processing or spreadsheet software but would never work on the same files simultaneously, a site license or multiple copy discount on the needed program would allow each user to work with the program independently. In this situation, a few inexpensive dot-matrix printers could produce draft copies, after which the user could log onto the network to print output on a shared laser printer.

Carrying this strategy one step further, a user with several tasks to perform could decide which one to focus on based on the current status of the network. If several users are already carrying out disk-intensive processes such as indexing large data bases or posting large batches of accounting transactions, another user might choose to run a program locally and return to the network when it is less busy.

A system in which most of the computers perform on their own is also less vulnerable to hardware failures. If the network file server goes down, users can at least continue to work on smaller files on their own computers.

In a system with few local mass storage devices, very little of the system "housekeeping"—backing up data, storing it, deleting obsolete files—can be carried out by individual users, which can be something of a mixed blessing. With experienced users, it is more likely that timely backups will be made and that all the directories on a hard disk will be examined periodically to make sure that the disk is not filled with old data. But this requires time— time that might be better used. In fact, a small company that has no network administrator or computer-sup-

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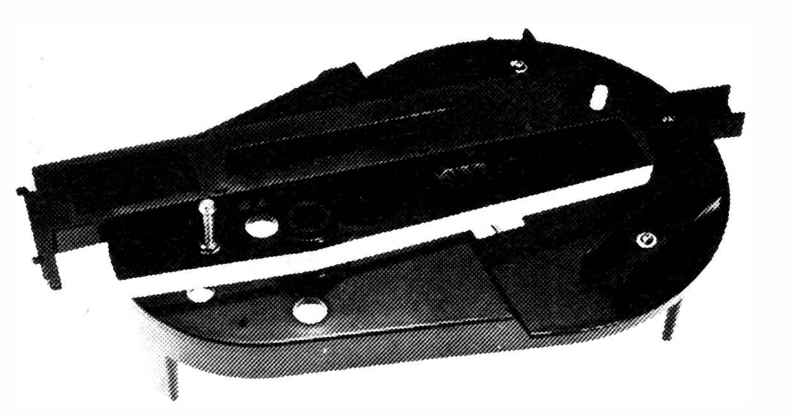

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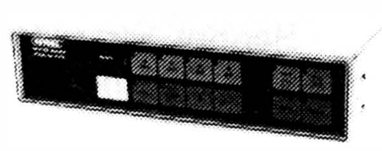

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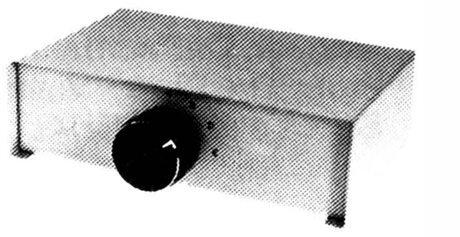

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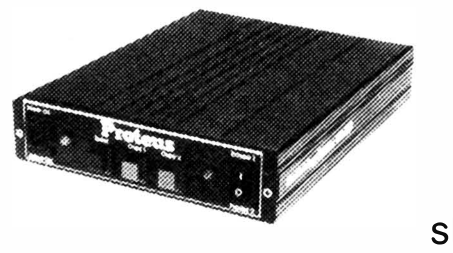

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port specialist responsible for maintaining the network may end up having to hire such a person.

Alternately, since many users will not be forced to take responsibility for maintaining their own files, they may remain limited in their knowlege of hardware and operating systems and may find themselves at a disadvantage if they later graduate to working on more capable systems that require greater expertise.

Where work is more tightly controlled, users will also spend less time "playing" with the computer and little or no time using it for personal business. The formal policies of most organizations forbid employees to make personal use of company computers but enforcement is often lax and sometimes use is tolerated after hours. A company as well as an employee stands to benefit from this less-structured, more relaxed time with a personal computer.

Faced with an urgent project and an approaching deadline, most people's tendency is to stick with familiar software and to use it in tried-and-true ways. Not everyone learns new concepts well—if at all—under pressure. On the other hand, during that extra hour spent "playing" with a non-work-related application, with time to make and correct mistakes, to search through manuals or help screens for instructions, the prospect of experimenting with new commands and techniques may seem less intimidating. The skills learned will later benefit the company.

All of these factors must be weighed when deciding whether to use diskless workstations or computers on a network. The best applications for diskless machines are in networks where data security and access control are very important, where many of the workstations will be running a limited number of programs in strictly prescribed ways, or where there is a need for high-volume data entry into shared data files. Often, this means a large company with a large network, and a data processing support staff to maintain that network.

In a less rigidly structured network, especially a smaller organization that has hooked up a few existing personal computers to a LAN to share a hard disk or to run a few applications where several users must access the same data files, diskless PCs are less appropriate. A company may set out to save money by eliminating disk drives and end up paying a high price later in lost flexibility as well as in user expertise. ■

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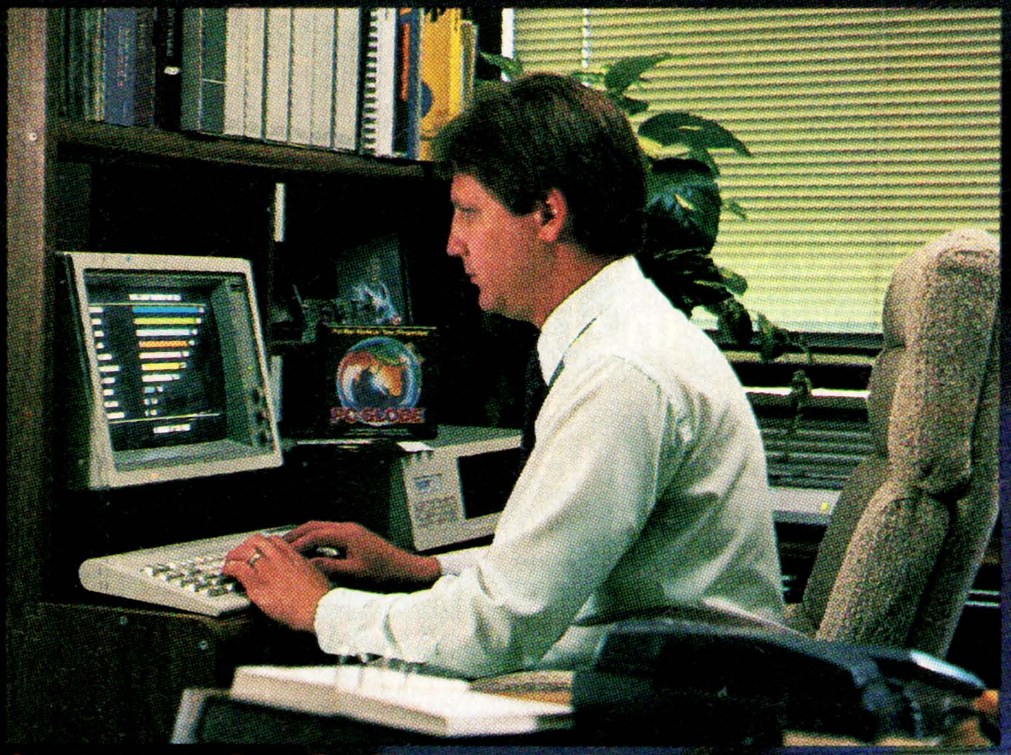

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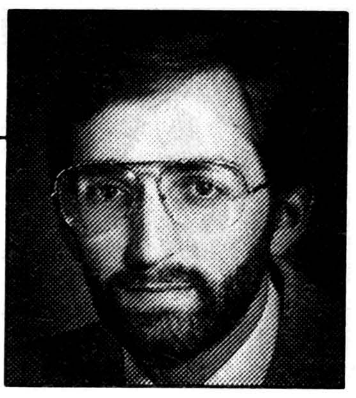
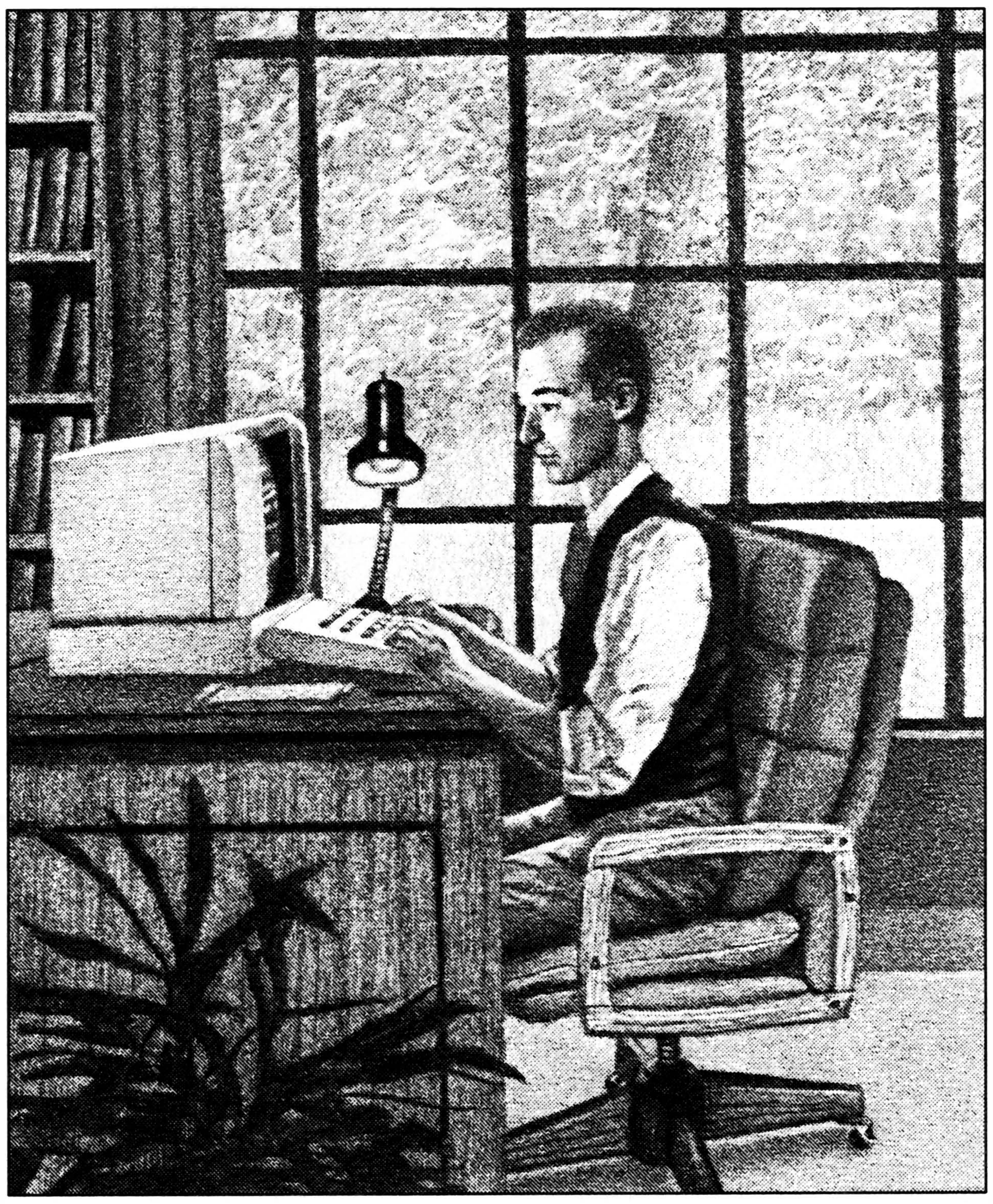
HOME OFFICE / Christopher O'Malley



Office Clout At Home



STEPHEN GERVAIS

Something rather dramatic is occurring within the dens and spare bedrooms of many an American home—and it has nothing at all to do with wallpaper or paneling. It's the emergence of the home office—the *real* home office, the one that is every bit as capable as a corporate office.

A dramatic development? Well, yes, it is. Sure as I sit here in my spare bedroom, flanked by computer and printer, I know it to be true. I'm doing the same work here I did in a conventional office only six months ago. I write, I file, I communicate, I calculate, and I weave these activities into something meaningful with the same proficiency—and difficulty—as I'd done inside a cubicle under a corporate roof. This situation, as unremarkable as it now seems to me and to millions of full-time or part-time home-office dwellers, was virtually impossible 10 years ago, and improbable only a year or two ago. That box in the corner, the personal computer, has slowly but irrevocably changed the pattern of our working lives.

It's not *where* the office exists that is of any significance, really; the quiet of a familiar room with windows that actually open is nice enough, but it may or may not be any more conducive to producing good work than the colder confines of an office building. Rather, it is the ability to accomplish work that matters, and the extent to which one can appreciate the quiet, open the windows, and then move forward, unhampered, to accomplish a day's tasks (or an evening's supplement).

Personal computers routinely help people work, and work well, usually under the fluorescent watch of a "real" office. But these are machines, after all, and one of the terrible/wonderful things about machines is they are indifferent—to people and to places. Bring home a box, tell it your spare bedroom is an adjunct office for General Motors, and it will invariably believe you. Actually, it will simply ignore you, which serves just as well. The box is ready to go, full speed ahead, because it can do nothing less.

Bringing home a box, the right box at a tolerable price, is a hurdle—one cleared by many and one many others are still sizing up. But it is no longer the Olympian obstacle it once was. Indeed, the renaissance of interest in computing at home appears to have risen not from a sudden mass awakening to the potential of computers, but from an astute group of consumers playing an important waiting game. "Yes, I will buy a personal computer," says John Q. Public, "when I feel comfortable about compatibility issues and the price comes down to earth."

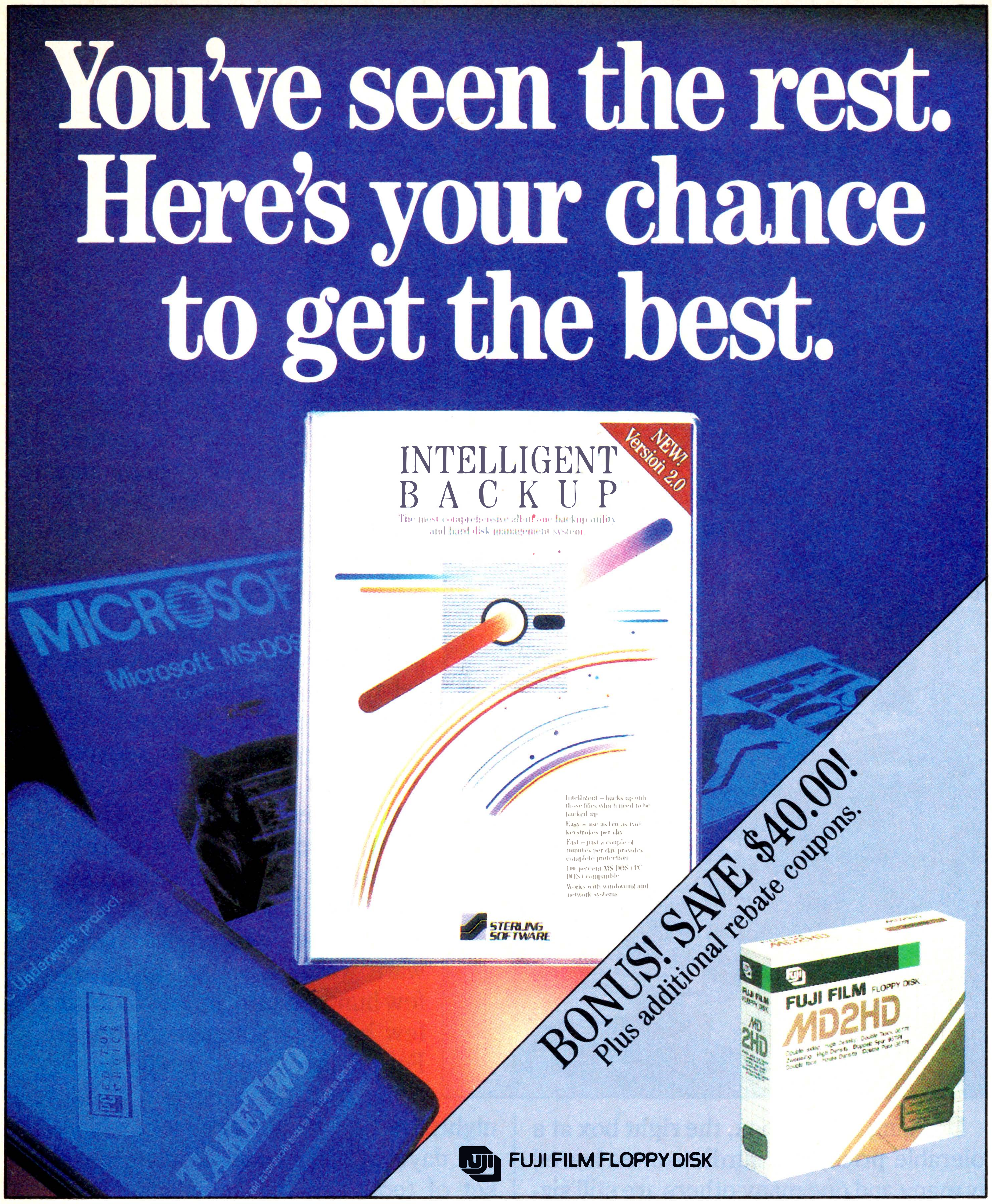
Both concerns have been alleviated to a certain extent. Compaq, Tandy, Epson, and a host of lesser knowns have—in deciding to play by IBM rules—made compatibility a foregone conclusion among MS-DOS machines. There are still exceptions, and minor transgressions, but the phrase "IBM-compatible" is no longer as suspect as "almost new." Apple Macintosh, meanwhile, has blossomed into an attractive line of computers, one offering its own set of standards and even an olive branch to the MS-DOS side of the street in its "open" boxes. And the price for today's more compatible, and generally more capable, computers? Roughly half that of two years ago.

This "more trust, fewer dollars" marketplace brought a lot of boxes into a lot of homes, and continues to do so. Buyers bring home more than equipment, though, more than just hardware and software. They bring home the working edge that once seemed the exclusive domain of the company office. And they bring home a bond between themselves and the outside, a link that endows the spare bedroom with a view no bay window can provide.

You can gain this edge and tap this link regardless of where you plunk down the box and when you choose to use it. Soliciting new business? Crank up the data base and get the word processing software warm: It's time to create a few hundred form letters to tickle a few hundred potential customers. Forget that you're in the sewing room and it's eleven o'clock at night; the big jobs don't call for ambiance and daylight, they require only the right set of tools and the knowledge to use them.

Sounds good in theory, but does it work? Yes, it does—or at least it can. It's easy to be a little intimidated about working on your own, especially with a computer. Frankly, I was, despite several years of rather intense experience with computers and a series of familiar tasks before me. Can I really do all of this, here and now, without the sense of structure and the support that a traditional office seems to offer? Well, that's not exactly how I remember phrasing it at the time (it was more like, "Now what?"), but it is how I felt. It takes an "office" job well done at home to give one the footing needed to see beyond immediate anxieties and realize the capabilities at hand.

My footing came via a mailing to 300 or so business contacts and colleagues. It was not an intriguing task, mind you, or an overly perplexing one, but it took on new proportions this time around. It was my proving ground. I gathered the names and addresses in my data base, then developed the form letter in my word processor. I bought a dot-matrix printer good enough to pass for a decent type-



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writer. The elements merged as they're supposed to, more or less, and out came form letters and labels every bit as good—better, in fact—than anything I'd produced inside the "real" office weeks earlier. Flush with accomplishment, and trying not to feel surprised at what I'd done, this concept of a second-to-none home office began to sink in as reality.

The point is, of course, that I imagined special limitations where none existed. I searched and sorted with my data base in my spare bedroom with the same proficiency as in that "other" office. I produced personalized form letters on my word processor with no less agility. And my printer, while no laser, outperformed anything given me for regular use thus far. Had I 3,000 or 30,000 letters to write instead of 300, nothing would have changed.

Understanding that the power in the computer is tied only to your skill in directing it, and not to where or when you use it, liberates you from the dependence—real or perceived—on the corporate office place. It is sometimes as much a psychological leap as it is a logical one.

Serious number-crunchers are among those who can revel in this office parity. Spreadsheets need not grow less versatile or more narrow in scope when ushered into a home office. Memory is cheap, and the MS-DOS computers with 640k have become as commonplace at home as in any corporation. Sophisticated software takes up some of that memory, naturally, but there's plenty of room to stretch out and juggle numbers. Advances like expanded memory cards (Intel's Above Board series, for example), though not as cheap as conventional memory upgrades, enable you to move beyond 640k when you need to. So do newer Macintosh models and, sooner or later, the 286 and 386 machines will get an operating system to harness their memory potential for complex spreadsheet models and projects of similar ambition.

None of this talk of parity should be construed as an exercise in keeping up with the cubicle-bound Joneses. If you can do the day's work with more modest trappings, why shell out the extra dollars for a personal computer? But it's there when you want it or need it, as sure as it is for the Fortune 500 department manager. And that's what is important.

You may, however, want to keep in touch with the Joneses. For that, your computer is a vital communications tool. Communicating by computer is an important charge in many offices, but it can be

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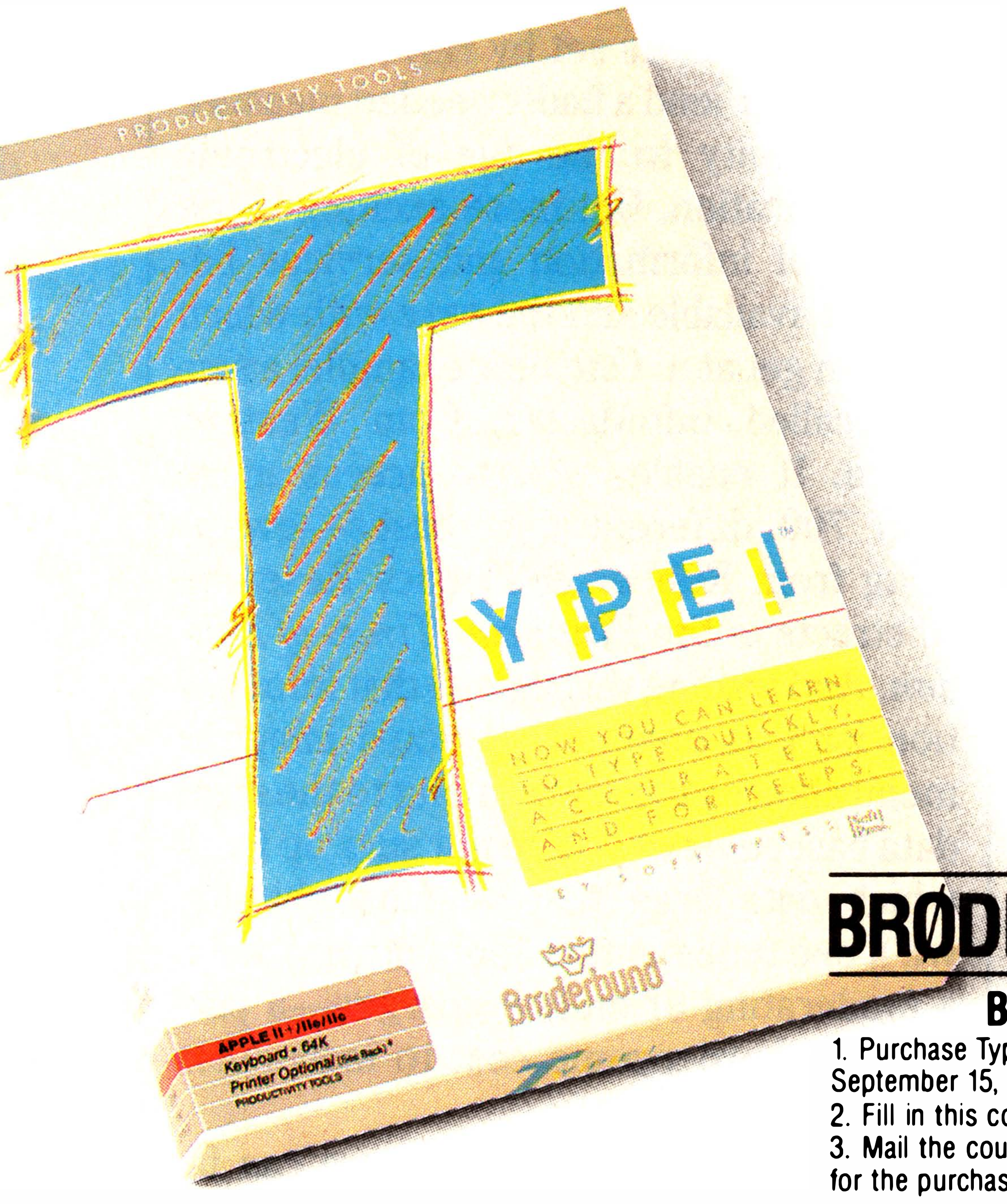

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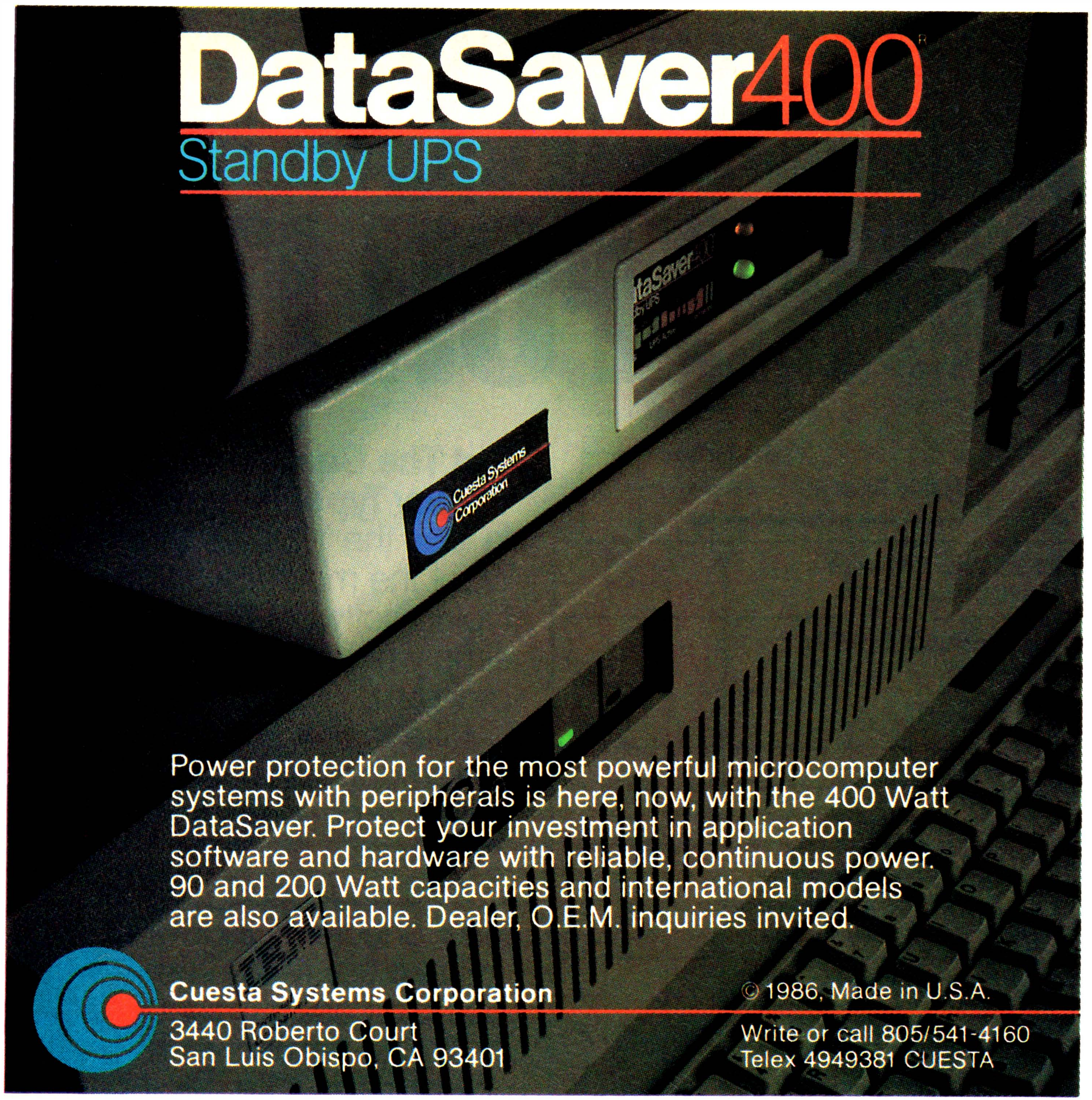

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the lifeline—more aptly, perhaps, the bottom line—of a home office. A phone call can still do plenty, but the telephone line presents you with an opportunity to do much more than talk. Armed with a modem and communications software, you can explore information services, tap mainframe data bases, exchange important files, swap ideas on bulletin boards, send and receive electronic mail . . . the possibilities go on.

A subscription to an on-line information service such as Dow Jones News/Retrieval, for instance, can put you on Wall Street—even if your spare bedroom happens to be in Cleveland. You might eye stock prices, get the late news that didn't make the morning paper, and gather information on a certain company. Communications that timely and extensive may be a luxury for some, but for others it's a finger on the pulse of the outside business world that makes a home office so viable.

Modems, like computers, have grown more affordable in the last year or two, and the standards set by Hayes modems in particular lend a badly needed measure of uniformity to the age of electronic communication. But more exciting is the wealth of information and services becoming available and the ease with which you can get at it. One new example: a service called InfoMaster, from Western Union. It enables you to access more than 700 different data bases—everything from Rubber & Plastics Research Abstracts to the *Financial Times of London*. And wading through all that information isn't as complex as you'd imagine; menu choices move you along to the right data base, even if you're not sure up front which data base that is. Undoubtedly, we'll see more of this and, with any luck, a moderating of on-line charges—a particularly burdensome cost to individuals paying their own way.

A personal computer at home can facilitate more traditional communication channels, too. Churning out letters en masse is one way but there are others: automatic phone dialing, for example, and electronic document exchange. In some cases, a modem can save you a trip outside the office, enabling you to place an order for your business or perform bank transactions.

Whether you spend an occasional evening of catchup in a home office or it's the center of your day-to-day business activity, the personal computer—that great equalizer of the 1980s—gives you an equal shot at success . . . even if you're shooting from the spare bedroom. ■

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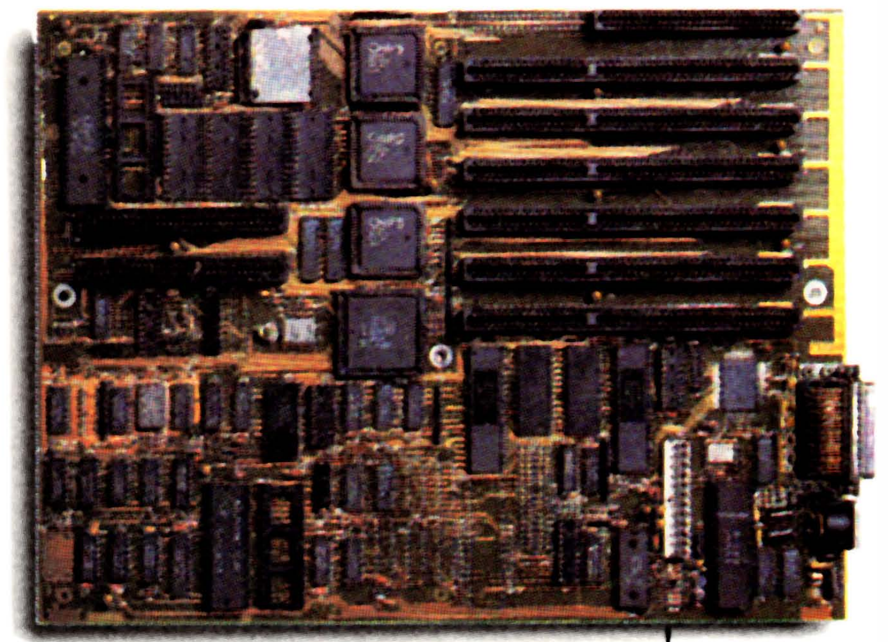

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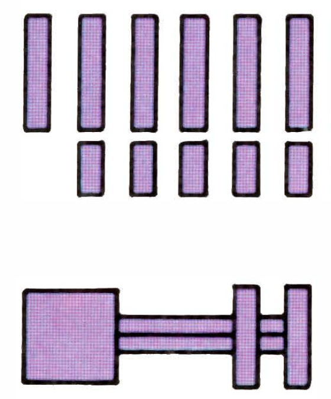

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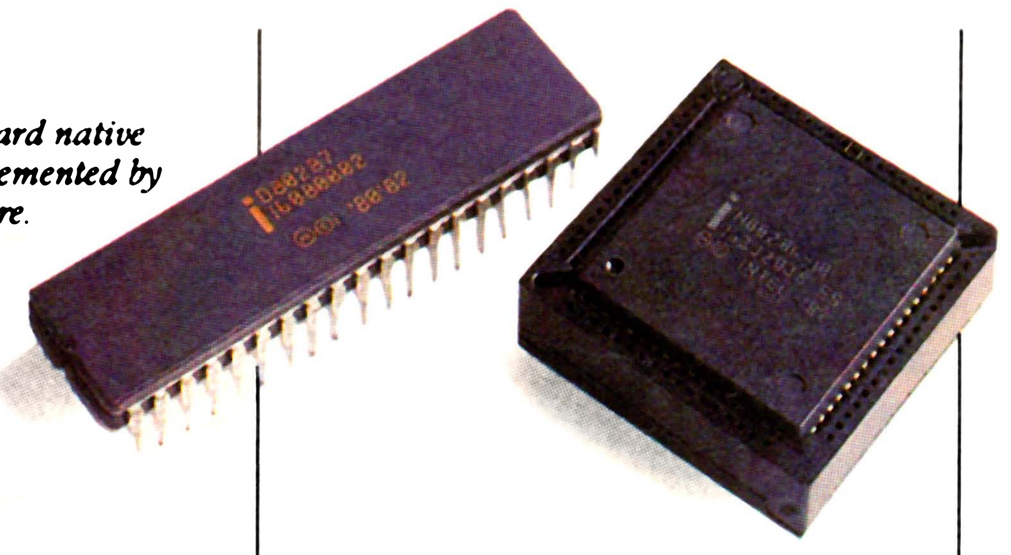

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PWR
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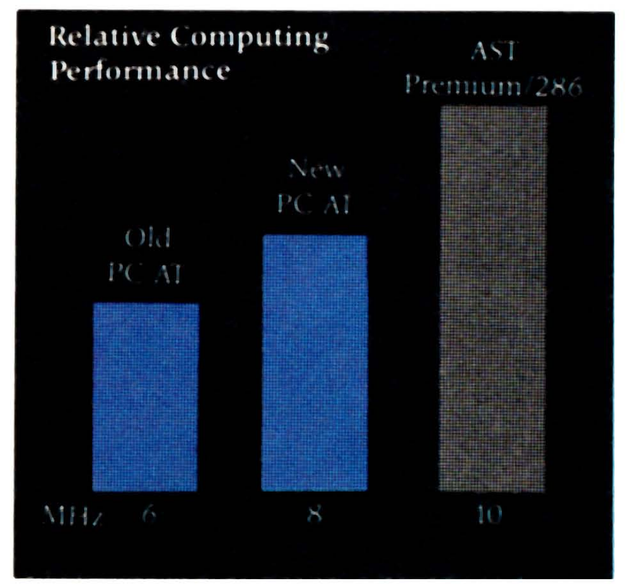
DISK



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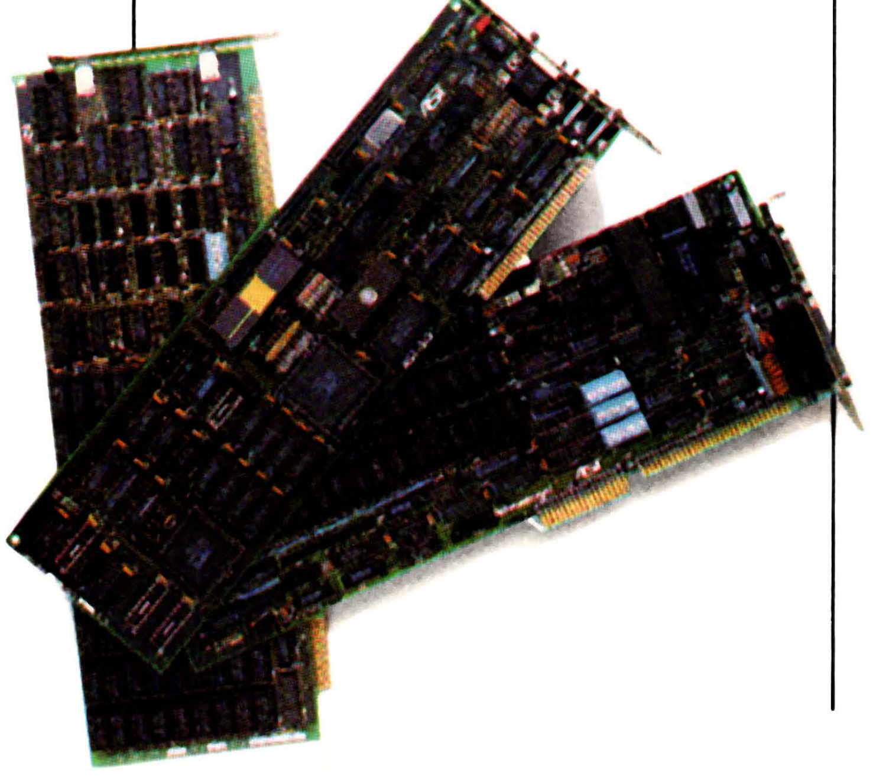

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DIRECTOR'S CHAIR HBO's full-time desktop publishing consultant Joseph Prieboy directs the production of promotional mailers on his department's Macs. On completion, the copy goes to a printer, who adds photos and color.

MARIA ROBLEDO

Setting Up For Desktop Publishing

In-house publishing pays off once a system's set up, but what's involved and who should oversee it?

by
Michael
Antonoff

As Aretha Franklin's song "I Knew You Were Waiting" charged up the pop music charts, Arista Records sent out weekly flyers to its dealers around the country, keeping them apprised of Franklin's concert tours and chart-topping hits. But when, some time later, Arista released several records in one week from the likes of Whitney Houston and Billy Ocean, the record maker wasn't able to generate its artists' flyers fast enough. Designers in Arista's Creative Services department found themselves staying until 8 or 10 o'clock at night waiting for type to come back from the company's in-house typesetters or for someone to paste a photo on a board.

Needing a quick and efficient way to produce flyers, Creative Services invested in a desktop publishing system that would develop and print them in-house. While the system met the goals of speed and efficiency, setting it up turned out to be more work than staff members anticipated.

Arista first had to decide whether to go with a Macintosh- or MS-DOS-based system. According to Millie DeFino, administrative assistant to the vice-president of finance and administration, "Everyone was pushing for Apple. But everything here is IBM, including a network. We decided we wanted software

Desktop publishing is too new to have standards in place. You can't just buy a system and start printing documents.

compatible with our existing system."

Initially, Arista installed Front Page from Studio Software. This was the beginning of the company's problems.

"We learned that in order for the program to work with the Mergenthaler typesetting equipment we have, we needed to upgrade to Front Page Plus," DeFino says. That meant paying $600 on top of the $695 already spent. But shortly after the new software arrived, Studio Software, the program's publisher, declared bankruptcy. On the recommendation of an outside consultant, Arista switched to Ventura Publisher from Xerox Corp.

"Then we couldn't print," recalls DeFino. (The computer was hooked to a QMS-PS 800, a serial laser printer with PostScript.) "At first we thought it was the printer. We went crazy hooking it up and taking it apart. When we realized there was nothing wrong with the printer, we called Ventura. The problem was something called handshaking. We had to put another command in the system file. It took us a week to figure all this out."

As for the mouse necessary to command Ventura, DeFino says, "I couldn't get used to the mouse. My hand is too heavy. I have to develop that touch." Amy Finkle, an assistant in the Creative Services department, now produces the flyers, as well as promotional literature enclosed with record albums sent to radio stations. "Everyone is giving her stuff to do. Her job is getting bigger and bigger," explains DeFino.

Desktop publishing is an application attracting businesses of all sizes. It is a way to save money and reduce the time between an idea's conception and its polished output. But, as Arista discovered, you can't just buy a desktop publishing system, plug it in, and start producing documents.

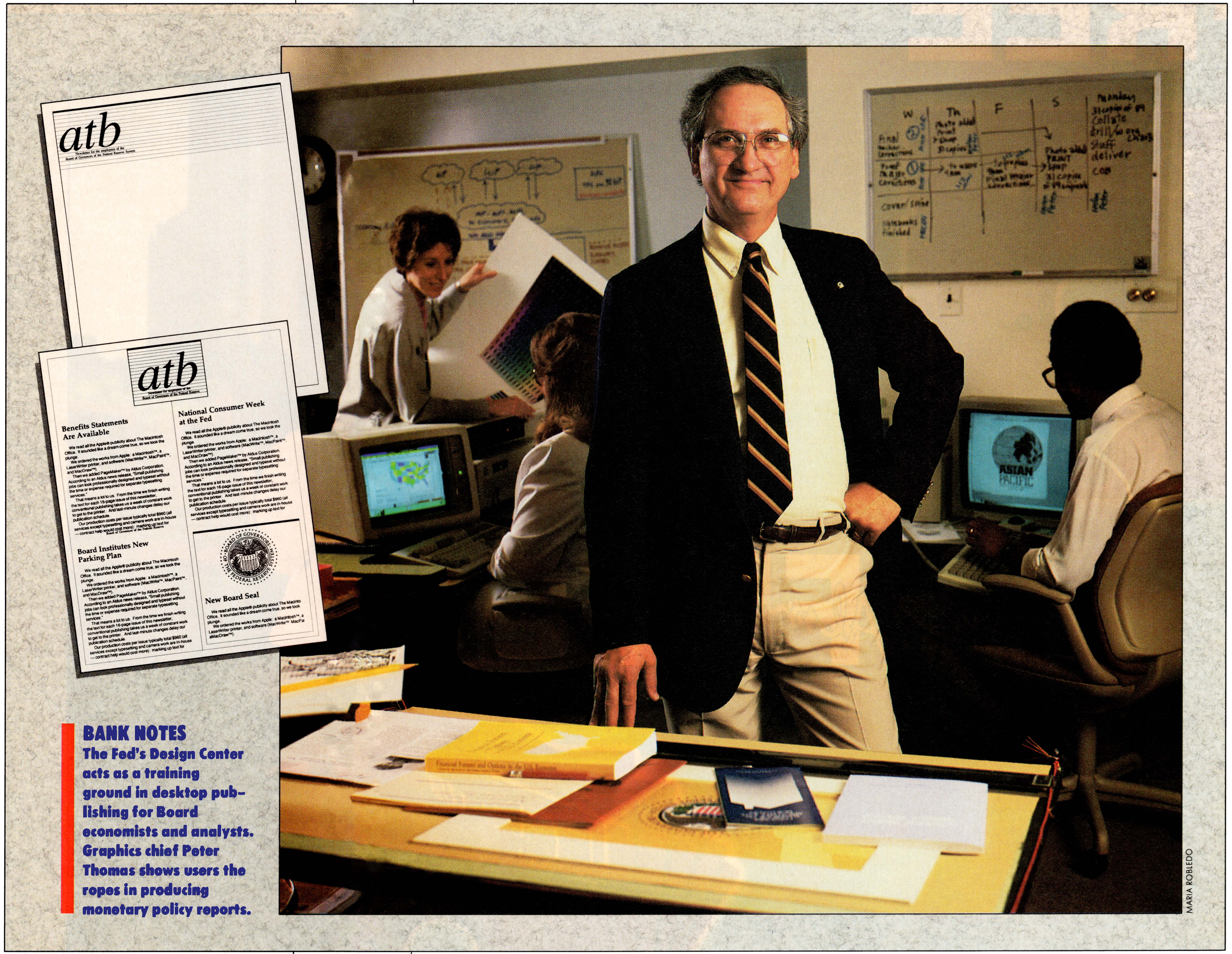
Setting up for desktop publishing is something akin to planning a camping trip. You have to know where you're headed and what you'll need. And it's a good idea to decide beforehand who'll be responsible for specific chores. If problems crop up along the way, advance planning can make the difference between a memorable weekend and "Friday the 13th, Part VI: Jason Forgets The Bologna."

Desktop publishing involves coordinating a number of elements. You have to choose a system that meets your printing needs, making numerous hardware and software decisions, and get everything to work together. This is no mean feat. Desktop publishing is too new to have standards in place. And you can't expect to compose a document in the same time it takes to make a photocopy.

As with Arista, a company's first decision has to do with choosing either a Macintosh- or an MS-DOS-based system. The Mac system is known as a "turnkey solution," since all of the desktop publishing components are designed to work together. Given 512k or more of memory, an external drive (preferably a hard disk), an Apple LaserWriter printer, and software, the system can be up and running in a minimal amount of time.

With an MS-DOS-based system, a lot more preparation is demanded up front. You'll probably want the speed of an 80286-based (IBM AT-level) computer with 640k of memory and a hard disk drive with 20Mb or more of storage space. More than 100 manufacturers now put their names on such computers. If you have a monitor with text-only display, you'll need to get a monochrome or color graphics display card and monitor because desktop publishing software is graphics-based rather than character-based. To work in color, you'll probably want an enhanced color adapter (EGA) display because the old color graphics adapter (CGA) standard offers only marginally acceptable display resolution.

The trouble with the Mac solution, as almost anyone in a dark blue suit will point out, is that the majority of businesses have invested billions of dollars in IBM-compatible equipment. They want to get the most from computers and software already in place, and they want to maintain the highest degree of compatibility. That usually means being able to pass disks



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Newsletter for employees of the
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Then we added PageMaker™ by Aldus Corporation. According to an Aldus news release, "Small publishing jobs can look professionally designed and typeset without the time or expense required for separate typesetting services."

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Board Institutes New Parking Plan

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New Board Seal

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BANK NOTES

The Fed's Design Center acts as a training ground in desktop publishing for Board economists and analysts. Graphics chief Peter Thomas shows users the ropes in producing monetary policy reports.

MARIA ROBLEDO

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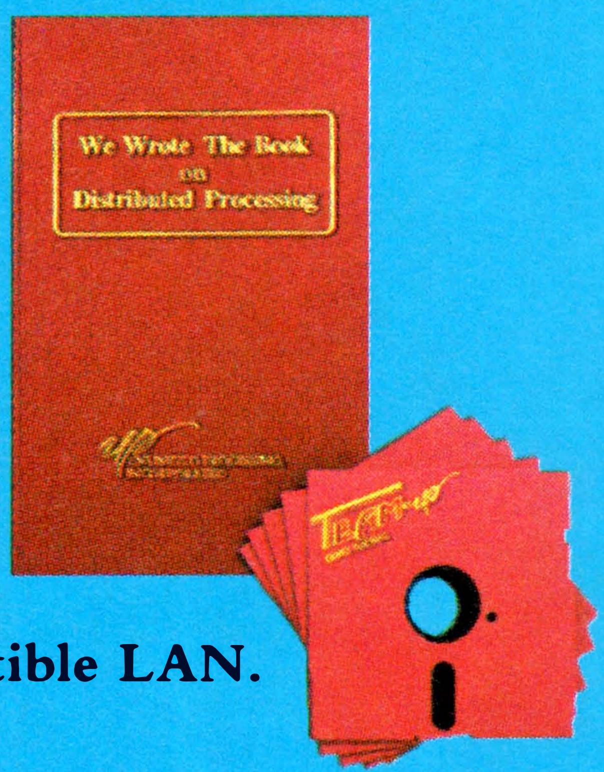

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back and forth, although with modems and in-house bulletin boards, Apples and IBMs can talk to each other.

Networks and add-in boards are ways for the two systems to coexist. Nevertheless, the Mac doesn't offer as many options as MS-DOS. While the Mac's operating system is built into a box that, until recently, couldn't even accommodate an add-in board, you can configure AT-compatible systems to meet almost any need. Macs may be easy to use, but they're less flexible in terms of the hardware and software you can use with them.

Many corporations are single-minded about staying with a known operating system. "Macs are not standard equipment," explains Yoram Lirtzman, an assistant treasurer at Banker's Trust in New York and the person responsible for desktop publishing throughout the bank. While he hasn't yet decided on which software the bank will choose to standardize throughout its departments, Lirtzman is sure of one thing: The program has to run on IBMs.

IBM-compatible setups have their critics. Ajit Kapoor, vice-president and director, electronic publishing market analysis for Dataquest, a San Jose, Calif., research firm, says, "Anything on a PC is a pain in the neck. The PC is such a flexible system that it gives you all these options. But publishing is really a turnkey application." Kapoor points out that just because a computer may be "AT-compatible" doesn't mean every system is identical in terms of what you have to do to get it set up properly.

Kapoor had to set up a desktop publishing system in his office. Voicing the frustration many have felt, he says, "the problem is that you're sitting there with a job to do. You have to make five or six presentations and you need to use a system that works and works quickly. Nobody has time to read manuals. I'm being paid to work." He calls the MS-DOS approach—even with Windows—an unfriendly and hostile one. "The machine was not meant for graphics. It was an afterthought." As for the Mac, he says, "Certainly it's a turnkey system that works."

So why did Kapoor go with an MS-DOS-based system? "My company is one of those PC-oriented companies. They want this to work in an IBM environment."

The printer you use in desktop publishing will have the most impact on the quality of your output. If you're producing page proofs as an interim step before sending your disks to a high-resolution typesetter, you can probably get by with a less expensive dot matrix or daisy wheel printer to check overall appearance. But if you want to produce copy with varying type styles, graphics, and scanned images, you'll need to use a laser printer.

With about 400,000 LaserJet, LaserJet+, and LaserJet Series II printers at work, Hewlett-Packard currently has about 70 percent of the laser printer market. If you simply want to print out proportionally spaced text, italicized text, and slightly larger headlines, you can get by with the original LaserJet and a font cartridge. However, you'll be sacrificing the ability to produce full-page graphs, drawings, and scanned images at the minimally acceptable 300 dots per inch (dpi) resolution, and extra-large, smooth headlines.

The LaserJet Series II has 512k, enough to produce a full page of graphics at 150 dpi. You may want to add a 1Mb board (HP includes a proprietary slot in the Series II) to increase the resolution of the output. On older LaserJet models, your dealer usually handles such an upgrade.

Alternately, you can go with a JLaser board from Tall Tree Systems, a 2Mb board that slides into your computer. You'll spend an hour taking apart the top of your Canon-based laser and attaching the JLaser cables. Before considering the JLaser board, however, make sure that the software you have in mind is compatible. Ventura Publisher and PC PaintBrush, a drawing and scanner capture package, are two programs that are.

On the other hand, you may be able to produce "camera-ready" pages from a desktop laser printer and thereby reduce typesetting and production costs. "Camera-ready" means that a page with all its elements—headlines, columns of text, captions, and pictures or holes for photographs—are in place and ready to be turned into a photographic plate by a print shop.

Another printer consideration is whether to have page description language (PDL), ROM-based software that has the intelligence to scale its built-in typefaces, called fonts, to any size you need. A PDL also produces special effects, such as rotating characters, and provides a pathway to professional typesetting equipment when you want output of a higher quality than a desktop laser printer can offer. The leading page description language, PostScript, is built into the Apple LaserWriter, QMS-PS 800, and Texas Instruments OmniLaser 2108.

PDLs are more versatile than Hewlett-Packard's bit fonts, which are limited to the size installed either as downloadable soft fonts (typefaces stored on disk) or plug-in cartridges. The protocol HP uses, called Printer Control Language (PCL), is the most widely emulated by laser printer makers and supported by software packages. But if you do want the extra versatility of PostScript in an older model LaserJet or other Canon-based printer, Laser Connection, a QMS subsidiary, offers one solution in the form of a board that replaces the cover of the original printer. Both IBM and HP have announced support for PostScript. Other PDLs are Interpress from Xerox and DDL from Imagen Corp. Ventura Publisher (release 1.1) supports both PostScript and Interpress;

Your printer will have the most impact on your output. And full-page screens make documents easier to design.

PageMaker supports PostScript.

In some offices, the responsibility for desktop publishing often lies with one who's attracted to its possibilities.

One creative department that wants the special effects possible with a page description language is Home Box Office, the pay movie service. To get the company's HBO letters to look like they're coming out at you, the in-house designers use PostScript built into the LaserWriter on their Mac setup. Unlike a bit-stored font on HP's plug-in font cartridges, PostScript contains the preprogrammed formulas, called algorithms, that resize, rotate, or shadow its outline fonts. Because such manipulation is processor-intensive, PostScript is slower than a straight bit-font transfer to the laser engine. But the tradeoff is more flexibility for someone like Eloise Vega, design director of *Affiliate Monthly*, a magazine that goes to those cable operators who carry HBO and Cinemax. Vega designs elements of the magazine on her Mac.

"We don't have the budget to experiment with effects by using outside services," says Vega, who uses a Macintosh. "The computers allow us to enrich the design of the magazine tremendously. We have the option of trying things and using them or not using them according to how they look. You can see the results in the issue."

Vega was taught Mac literacy by Joseph Prieboy, HBO's in-house desktop publishing consultant. "On our floor the only person who has an IBM is a secretary," says Prieboy disdainfully. (Former Apple Chairman Steve Jobs might call him "a believer.") According to Prieboy, by using Macs and LaserWriters, HBO's creative department saved almost $30,000 in three months—money that the company previously spent on outside typesetters and freelancers.

Large-screen displays make desktop publishing systems easier to use whether you work on a Mac or an IBM. For one thing, if you're using Ventura publisher in edit mode, you see only half the width of the page at a size in which you can read text. If you're trying to type across the page, you'll have to use the mouse to scroll to the other half. That's hardly efficient, which is one reason people do the bulk of their text input and editing in a word processor *before* importing it into page-makeup software.

The advantage of a full-page-size monitor is that you won't have to scroll left and right or up and down to see the entire page. Peter Ginn, senior systems and software specialist at Dow Chemical in Freeport, Texas, has set up Ventura to run with Micro Display System's tall Genius monitor, which shows a full 8.5- by 11-inch page at once. Since Dow creates scripts for producing interactive video trainers, it helps Ginn if he can see video directions in the left column of the script along with audio dialog or narration in the right. Ginn, a programmer, was immediately drawn to the large-screen display because it allows him to see a full page at once. "I don't think in 25 lines," he says.

Large-screen displays also attracted the attention of the Metropolitan Waste Control Commission in St. Paul, Minn. The Commission communicates via quarterly newsletters to politicians in the 103 Twin Cities communities. Dave Juba, the Commission's program analyst, uses Ventura with a Genius monitor which displays 66 lines—a full page—in WordPerfect. Ventura Publisher runs on an office AT hooked to a Texas Instruments OmniLaser 2108 printer.

Juba is now teaching Julie Lehr, the Commission's new public information officer, about computers and Ventura so she can put out the next issue of *The MWCC Connection.* "Before coming here, my computing experience was limited to sticking game cartridges in my children's Commodore," she says. Luckily, Lehr is no stranger to page make-up, having edited a small newspaper.

Desktop publishing isn't for everyone. A secretary who knows word processing is not likely to have the skills of a design director, and computer programmers do not always know the difference between a point and a pica.

So who should manage the desktop publishing operation? How many people should be involved? Will one person still do the design work, another input the text, and someone else merge these into a printed document?

"It really varies," says Nancy E. Erskine, program director and desktop publishing consultant for Gartner Group, Inc., a Stamford, Conn. research firm that deals with Fortune 500 companies. In some offices, it may be an individual who has taken up the desktop publishing banner and learned through trial and error. In others, an ad hoc department may do desktop publishing work for departments throughout the company.

One institution, the Board Of Governors of the Federal Reserve System in Washington, D.C., perhaps best exemplifies setting up desktop publishing on a large scale, then passing skills down to individual users. The Board's newly formed Design Center uses the combined capabilities of its graphics chief, Peter Thomas, and its associate director of information resources, Stephen Malphrus. As a peripheral support group, the Center treats other departments at the Fed as what Thomas calls "clients," comprising the Board's 1,500 employees divided among 17 offices nationwide. Rather than choose an IBM-based system *instead of* a Macintosh, the Board installed the best of both worlds. It also ties in networks and mainframes.

"We operate like a small ad agency," explains Thomas, whose job includes producing thousands of slides per year and managing internal and external typesetting services. That production shop role is now changing into more of a training center for the Board's analysts and economists. The economists collect and analyze raw data relating to the money sup-

Interceptor projects to enhance water quality in metro area
The Link
Spring 1987
A quarterly publication from the Metropolitan Waste Control Commission
New law creates uniform sewage rate
to get job done
Breakfast meeting scheduled
MWCC Monthly Meeting Schedule
Interceptor projects to enhance water quality in metro area

IN CONTACT
Julie Lehr's experience in page makeup serves her well in her duties as editor of the Metropolitan Waste Commission newsletter. Lehr uses a full-page monitor so she can see the overall layout of a page.

JAMES SCHNEPF

ply around the country and overseas, then issue reports for use in implementing U.S. monetary policy.

Rather than depending on in-house specialists to produce presentation-quality work for them, the economists can now come to the Design Center. There, working alongside both graphics experts and computer specialists, they learn to produce the text and graphics needed to publish reports themselves. It is knowledge they can then take back to desktop publishing setups in their own offices.

"The attitude we have at The Design Center is that we're now moving more into a consulting role," explains Thomas. Earlier on, Thomas says, "As [in-house] publishing needs grew, we were sitting with programmers who could help us understand how users could type data in their word processors and bypass our typesetters." Then, "as word processing needs

In time, templates will reduce much of the training necessary for desktop publishing. That will further its user base.

grew at the Board, we recognized that some of our backlog could be addressed by users doing more of this work themselves. We were in the frame of mind to accept and encourage desktop publishing. People will elect to do more of this work themselves. It's a dynamic period of change." Besides saving the Board money previously spent for typesetting and paste-up, desktop publishing affords end-users more control over their work, he adds. "Users can help themselves."

Who will get Design Center training? "The cadre of people who have the most to benefit initially will be trained to take text and move it into the world of desktop publishing," Malphrus continues. "They'll learn to operate a program like PageMaker. They'll have an interest in it because it makes their jobs easier." Malphrus estimates that 5 percent of the Federal Reserve Board's installed PC users will initially be trained to do desktop publishing, with that percentage growing to 20 percent over the next two years.

Previously, he says, there were more people involved between an end user—a financial analyst for example—and the report he or she produced. There might be a computer programmer as well as a data entry person sitting at a terminal. "By virtue of putting an integrated system into place, you'll be seeing fewer intermediaries," says Malphrus. "The technology is being placed closer to the people who use it. Desktop publishing will be performed by the professionals who have the need to publish."

Though the Federal Reserve System's Design Center is, according to Thomas "only at the threshold," its tools now encompass "fully loaded" IBM AT computers. That includes the Intel Above Board, Microsoft Mouse, 80287 math coprocessor, IBM's Enhanced Graphics Adapter and Enhanced Color Display, and 3278/79 Advanced Emulation Adapter for communication to a mainframe. Microtek's Intelligent Image Scanner, MS-300A, is hooked up. Software includes DisplayWrite 4, PageMaker For The PC, Microsoft Windows, and, for use with the scanner, Read-Right software. Thomas is considering Ventura Publisher, a PageMaker competitor, and Adobe Illustrator, a graphics program that drives Adobe's page description language, PostScript. The latter is built into the Apple LaserWriter Plus, a laser printer the center also has. Also running are a Macintosh Plus with a Megascreen display, 800k external disk drive, Hyperdrive FX/20 external hard drive, and Honeywell Quad Lynx Track Ball. Software includes PageMaker (version 2 for the Mac was released this Spring), MacDraft, Cricket Graph, Super Paint, and Microsoft Word. The center will open this summer. One of its first projects will be a published guide for Federal Reserve System employees describing the Design Center and the services available there.

According to Malphrus, the Design Center is part of a larger picture "to move the Board into the 20th Century." With 98 percent of the Board's IBM PCs hooked to a mainframe, which in turn is linked to a dozen data processing sites around the country, Malphrus says the overall goal is to allow the end user to sit down at a PC, access and analyze mainframe data, and access documents electronically. "An analyst or economist should be able to move data from the mainframe into the PC in a usable format." With analysis completed on the PC, the work can then be sent out electronically. Though the Design Center's final products consist of paper and slides, "Ultimately, hard copy will not be printed out until there's a person who needs it."

In the next few years, templates are likely to mitigate the desktop publishing training problem, says The Gartner Group's Erskine. "A lot of the design work necessary to make a brochure or newsletter look good will become more automatic in the future with the advent of templates." People in the past who would "send things out" will in the future be able to call up a desktop publishing template just as easily, she predicts.

As the price of the technology continues to drop, there is incentive for managers to reexamine the question of whether the old way of doing things, such as sending out work or relegating all graphics work to a special department, makes the most sense in terms of economics and efficiency. In 1984, $10,000 bought a fully configured 286 computer running word processing software and a daisy wheel printer. In 1987, the same money buys that 286 computer plus a 300 dots-per-inch laser, scanner, and page composition software. By 1990, according to Hewlett-Packard, you'll be able to purchase a fully configured 386, a laser producing greater than 300 dpi output, an optical character reader, voice input, and document-composition software.

Erskine explains, "The whole way we think about desktop publishing will change, because people aren't really going to have to think about it. People are going to have a template. They just throw the information into it. The graphics arts expertise will already be built into that template. We're seeing that to an extent with Ventura [citing the style sheets included with the program]. We'll certainly go well beyond that. In the future, people will no longer have the perception that they have to do something more. The advantage will be increased control in less time.

"People doing desktop publishing now are people who want to do it," says Erskine. "They have the desire. They don't know exactly how to get their arms around it. When the laggards get into desktop publishing, [mountaineering the steep learning curve] won't be as much of an issue." ■

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The Output Side Of Data Bases

1 Placing specific information in the order that you need it

2 Getting the data in a presentable report you can distribute

3 Doing it quickly with macros that make reporting automatic

by Christopher O'Malley

So now that the information has been entered, the challenge is getting it out. It is a succinct chronology, one that perhaps does not do justice to all of the sifting and sorting that goes on between data entry and data exit. But it does correctly emphasize the importance of the printed report—the vehicle that gets information out of a data base and into the hands of people who can act upon it.

Make no mistake. In some narrow applications, you can use data base software to sock away names and numbers and then review them only on the computer screen to keep matters under control. Still, the paperless office is more science fiction than business reality—thanks in no small part to the preponderance of information made available by our personal computers and data base software. Many different company records, forms, and invoices demand printed data base output; and so too, for the sake of efficiency and clarity, do many other collections of information. Sometimes, it seems, there's no substitute for poring over paper when you want the big picture.

Alas, getting information out can be every bit as tedious as getting it in. You must con-

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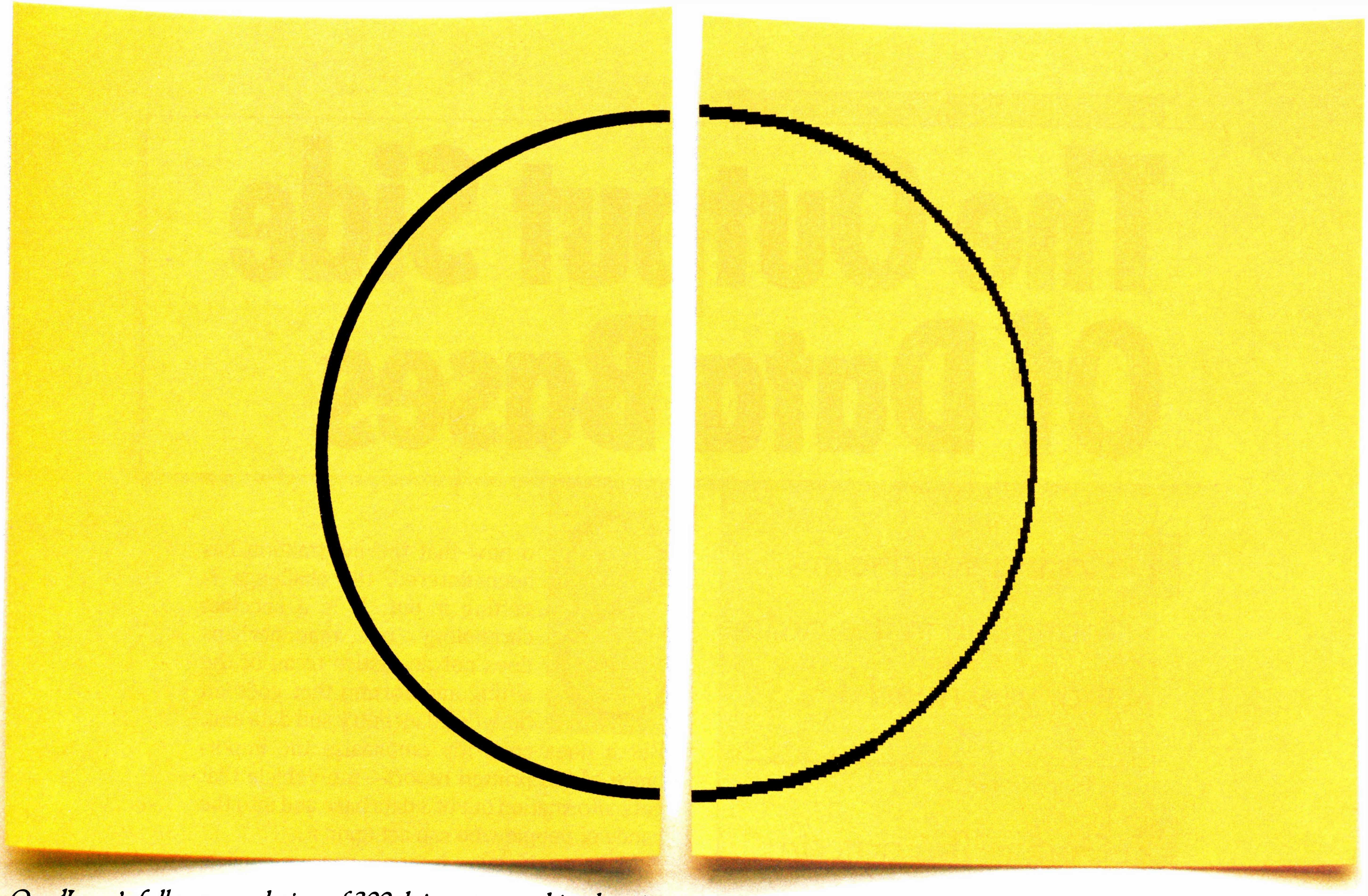

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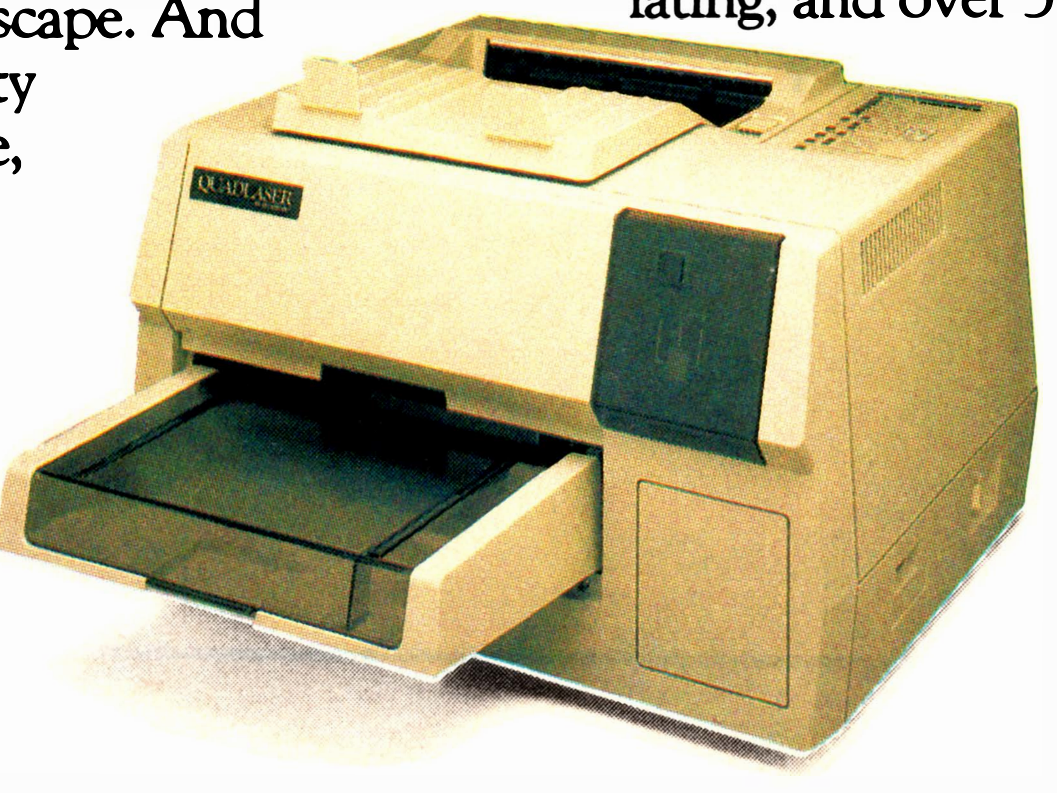

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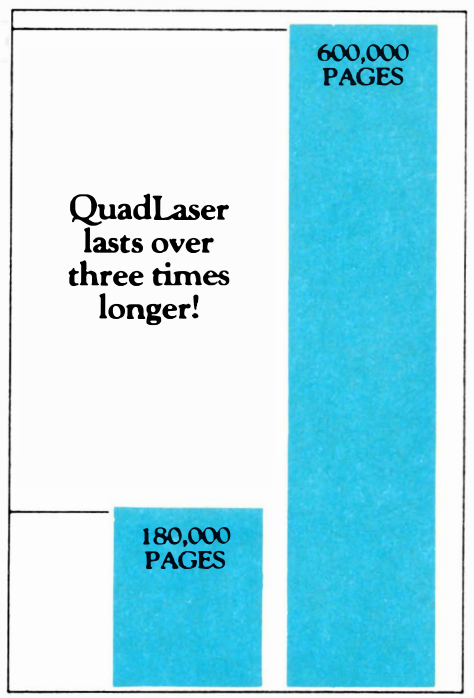

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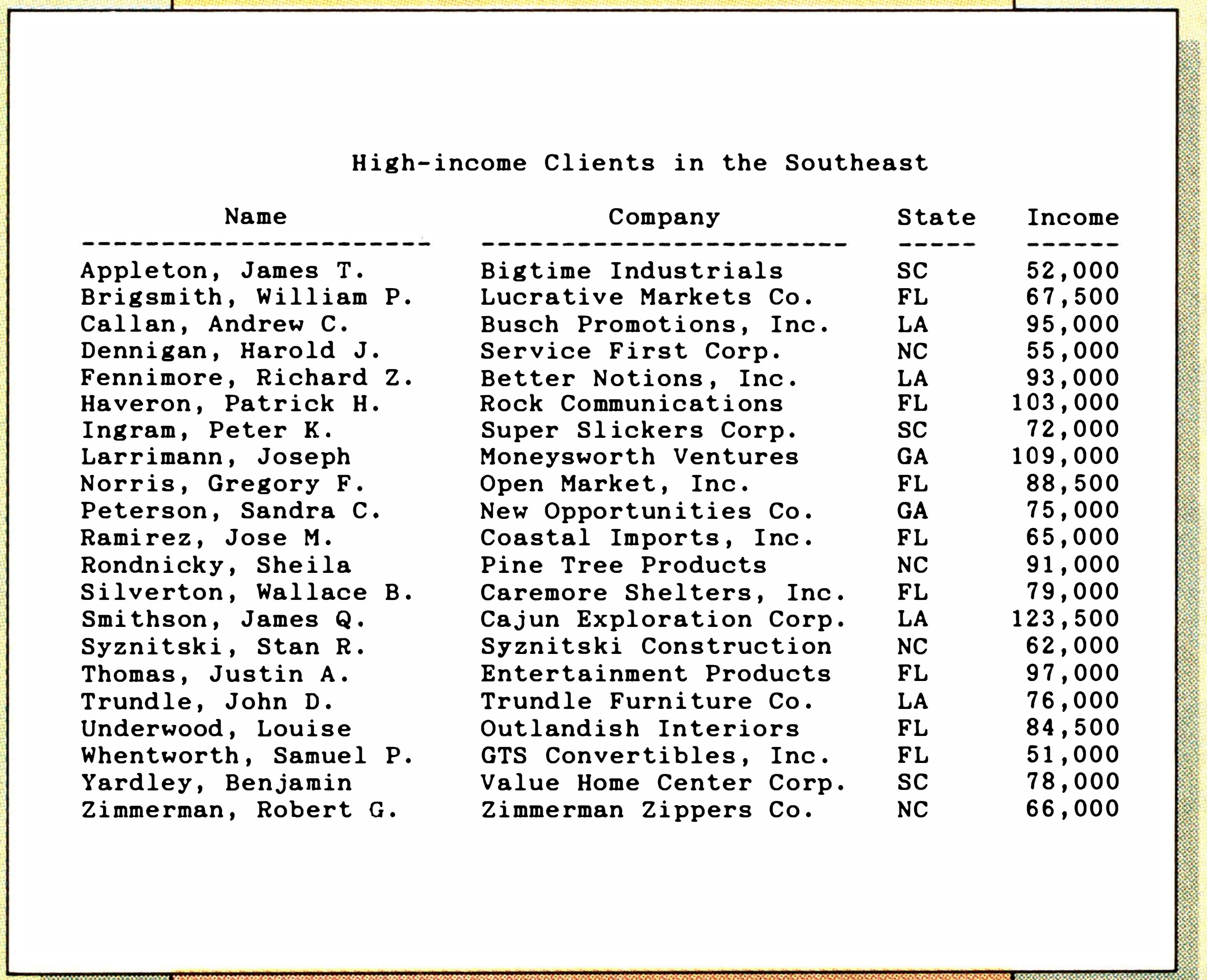

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                 High-income Clients in the Southeast

         Name                    Company          State    Income
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Appleton, James T.       Bigtime Industrials      SC       52,000
Brigsmith, William P.    Lucrative Markets Co.    FL       67,500
Callan, Andrew C.        Busch Promotions, Inc.   LA       95,000
Dennigan, Harold J.      Service First Corp.      NC       55,000
Fennimore, Richard Z.    Better Notions, Inc.     LA       93,000
Haveron, Patrick H.      Rock Communications      FL      103,000
Ingram, Peter K.         Super Slickers Corp.     SC       72,000
Larrimann, Joseph        Moneysworth Ventures     GA      109,000
Norris, Gregory F.       Open Market, Inc.        FL       88,500
Peterson, Sandra C.      New Opportunities Co.    GA       75,000
Ramirez, Jose M.         Coastal Imports, Inc.    FL       65,000
Rondnicky, Sheila        Pine Tree Products       NC       91,000
Silverton, Wallace B.    Caremore Shelters, Inc.  FL       79,000
Smithson, James Q.       Cajun Exploration Corp.  LA      123,500
Syznitski, Stan R.       Syznitski Construction   NC       62,000
Thomas, Justin A.        Entertainment Products   FL       97,000
Trundle, John D.         Trundle Furniture Co.    LA       76,000
Underwood, Louise        Outlandish Interiors     FL       84,500
Whentworth, Samuel P.    GTS Convertibles, Inc.   FL       51,000
Yardley, Benjamin        Value Home Center Corp.  SC       78,000
Zimmerman, Robert G.     Zimmerman Zippers Co.    NC       66,000
```

We wanted to find only those clients from our data base who lived in southeastern states and earned more than $50,000 a year. A compound search instruction in Q&A produced this report, which we also had alphabetized.

front some questions—lots of them—before you get answers: Which records do you want to include in this report? Which fields? In what priority? How should they be arranged on the page? Are there figures to be calculated? Will there be a title and subtitle? Headers and footers? Do you need one copy or several? Is that regular or compressed type? And the list goes on.

Ideally, data base programs would ask these questions of you and alert you to possible oversights. ("Are you sure you want the report entries sorted by record number, and not by last name?") They do not. Not yet, anyway. This process of culling information and sensibly presenting it on paper therefore involves a great deal of trial and error. You may find it takes several hours to generate the summary you require if you're new to the reporting maze. And it can be a slow, repetitive routine even for old hands.

Mercifully, there are ways to expedite the process of getting out the vital information in your data base. There's no getting around the rough spots early on, but you can make regular reporting an exercise in finesse rather than frustration, regardless of which program you use.

BACK TO BASICS How do you acquire the skills to rattle off reports as quickly as you—or colleagues—need them? It's the same way Larry Bird learned to hit three-point jump shots in the closing minutes of tight basketball contests: practice. It's not a very enticing prospect, perhaps, but there's no other way to discover what your data base software can do and how it can do it. Start by becoming intimately familiar with the basics of searching and sorting.

It's easy to regard the process of producing reports as merely a cantankerous formatting or printing problem to be ironed out—and it is certainly part that. But reporting is inexorably linked with the fundamentals of searching and sorting, those electronic filtering commands that are the primary movers and shakers of data base information. Report axiom number one is: Before you decide what goes where, you must define the scope of "what." What data is pertinent to this report? What is not?

It is rare indeed that a report calls for every record in your data base irrespective of sequence or value. It is far more likely to need only a subset of records and to require that they follow each other in some alphabetical or numerical order. A report showing all customers with outstanding balances, for example, might first require that you narrow the data base file to include only those records with an "N" (No) in the field marked "payment received." It might then require that you sequence this subset of records by customer names or zip codes so you can prepare a mailing.

Selectively retrieving a group of records and sequencing them by one or more aspects of the information they contain is a vital part of the reporting process. It is crucial, therefore, that you fathom how to filter through your data base files. Exactly how much you really need to know depends on the complexity of the reports you desire. A simple Sort command may suffice for an alphabetized listing of all records. However, culling a list of clients that reside in southeastern states and maintain annual incomes of $50,000 or more requires that you know how to use mathematical operators (equal to, greater than, etc.) and logic connectors (and, or) to seek out the right subset of records; and then know how to apply sorting commands or index files to sequence them properly.

So integral to reporting are the searching and sorting routines that some programs, for the sake of simplicity, combine the steps. With Q&A, for instance, selecting which records to use and choosing how to sequence information is part of the process of designing a report. Suppose, as noted in the above example, you want to create from your Q&A data base a list of clients in southeastern states that earn at least $50,000 a year. Once you've selected "report" from the main menu and "design/redesign" from the menu that follows, you can pool the needed records (Q&A calls them forms) by entering search instructions on the "retrieve spec" form that next appears. In this case, the "state" and "income" fields are the real key. Only those clients in southeastern states—say, Florida, Louisiana, Georgia and the Carolinas—with incomes greater than $50,000 are desired. Two instructions are necessary: FL;LA;GA;NC;SC in the "state" field and > =50,000 in the "income" field. Q&A uses semicolons to mean "or," and the > = symbol to denote "equal to or greater than."

After you've told Q&A which records (or forms) to use for your report, you must tell the program how to arrange this information. The "column/sort spec" screen appears next, so you can decide which field goes in which column, and in what order. You might use the "name," "company," "state" and "income" fields as columns one through four, respectively, and then sort each column in ascending order. To do this, type in the column numbers (1 to 4) next to the four field names, and add the "AS" ascending sort code next to each (separated by commas, as in 1,AS). Your report will then list well-to-do southeastern clients sorted primarily by name, and secondarily by company, state and income.

Q&A has another, potentially faster, way to search through and sort out its data base information: plain-English commands. With its "intelligent assistant," you might request information of Q&A with a command such as "Show me a list of clients who live in southeastern states and earn $50,000 or more." But before you can rattle off questions and expect answers, you must become familiar with the syntax and methods of the intelligent assistant, and "teach" it about the contents of your data base.

With many other programs, such as dBase III Plus and Alpha/three, searching and sorting operations are largely in-

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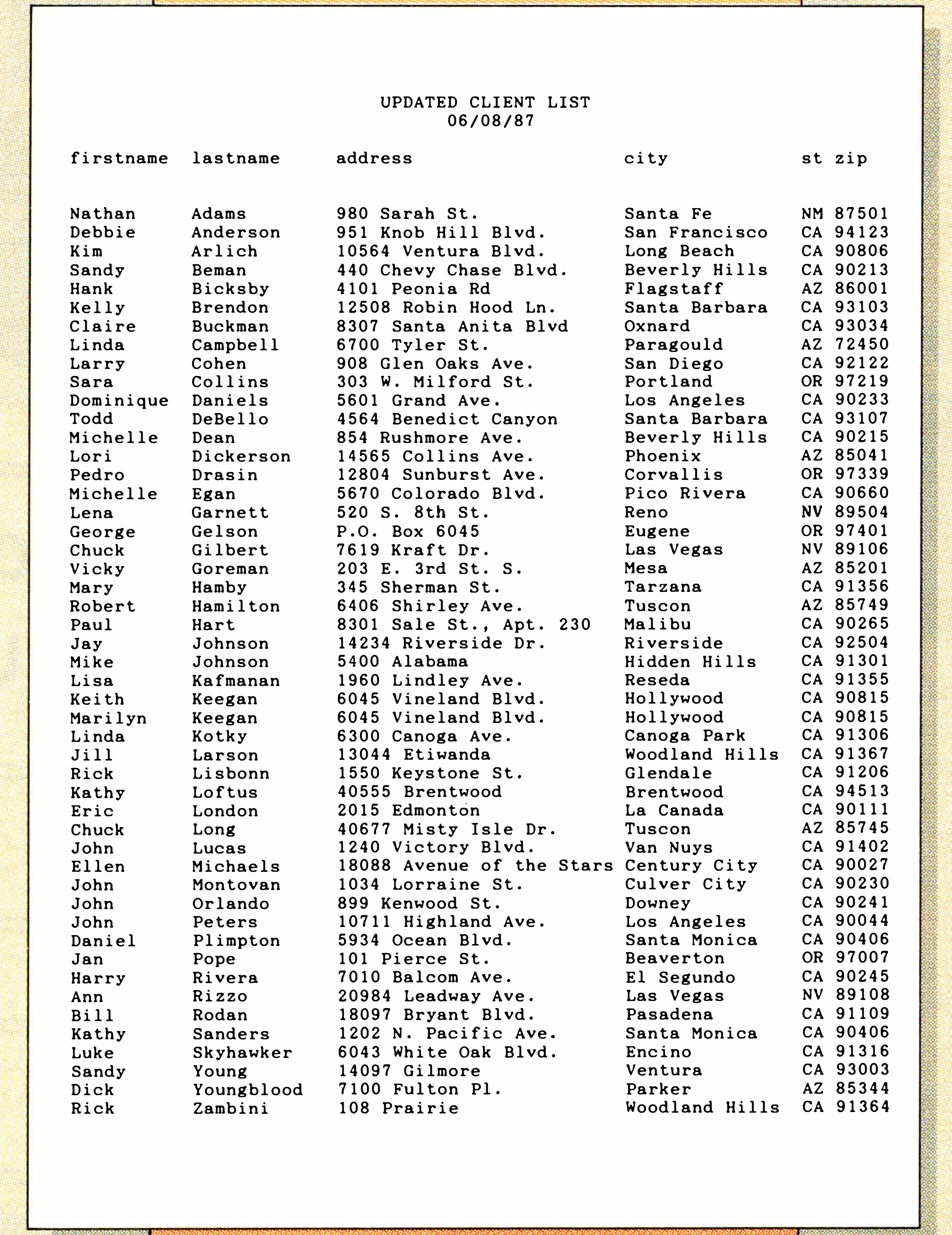

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firstname  lastname    address                   city           st zip


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Sandy      Beman       440 Chevy Chase Blvd.     Beverly Hills  CA 90213
Hank       Bicksby     4101 Peonia Rd            Flagstaff      AZ 86001
Kelly      Brendon     12508 Robin Hood Ln.      Santa Barbara  CA 93103
Claire     Buckman     8307 Santa Anita Blvd     Oxnard         CA 93034
Linda      Campbell    6700 Tyler St.            Paragould      AZ 72450
Larry      Cohen       908 Glen Oaks Ave.        San Diego      CA 92122
Sara       Collins     303 W. Milford St.        Portland       OR 97219
Dominique  Daniels     5601 Grand Ave.           Los Angeles    CA 90233
Todd       DeBello     4564 Benedict Canyon      Santa Barbara  CA 93107
Michelle   Dean        854 Rushmore Ave.         Beverly Hills  CA 90215
Lori       Dickerson   14565 Collins Ave.        Phoenix        AZ 85041
Pedro      Drasin      12804 Sunburst Ave.       Corvallis      OR 97339
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John       Montovan    1034 Lorraine St.         Culver City    CA 90230
John       Orlando     899 Kenwood St.           Downey         CA 90241
John       Peters      10711 Highland Ave.       Los Angeles    CA 90044
Daniel     Plimpton    5934 Ocean Blvd.          Santa Monica   CA 90406
Jan        Pope        101 Pierce St.            Beaverton      OR 97007
Harry      Rivera      7010 Balcom Ave.          El Segundo     CA 90245
Ann        Rizzo       20984 Leadway Ave.        Las Vegas      NV 89108
Bill       Rodan       18097 Bryant Blvd.        Pasadena       CA 91109
Kathy      Sanders     1202 N. Pacific Ave.      Santa Monica   CA 90406
Luke       Skyhawker   6043 White Oak Blvd.      Encino         CA 91316
Sandy      Young       14097 Gilmore             Ventura        CA 93003
Dick       Youngblood  7100 Fulton Pl.           Parker         AZ 85344
Rick       Zambini     108 Prairie               Woodland Hills CA 91364
```

The client list is sorted alphabetically by last name. This general-purpose report format is a simple name and address list. It is taken from the dBase III Plus sample file normally used for training new users. It is a typical report.

dependent of the report design. But, while exact procedures may differ, the filtering basics are essentially similar. And many programs that separate searching and sorting instructions from report design enable you to save and recall the queries you devise, so you can mate them with a report layout. Alpha/three uses a "saved search" and dBaseIII Plus a "query file," for example, to keep the search instructions, and each uses "index" files for sorting instructions.

All of this talk about searching and sorting rigor isn't meant to play down the formatting and printing process, which is every bit as vital to fast and accurate reporting. Call it report axiom number two: Casting the right information in a proper light makes words and figures meaningful. What type of report works best here? How should it appear on the page?

You can, and should, experiment with report formats and with their printed consequences. Before you get to the intricacies of page layout, set some objectives and choose (or create) a report type that gets the job done. Some data base managers include predefined report shells. PFS:Professional File, for example, gives you three report types to choose from: crosstab (cross-tabulate), lists, and records/labels. With many other programs, however, you have to start from scratch; there are no predefined report types in dBase III Plus, for instance. The *tabulae rasae* approach of dBase and many other full-featured data managers can be perplexing at first, but ultimately a clean slate is more flexible.

Arranging the details of a report layout—the titles, margins, spacing, headers, footers, and so on—is, usually, the least oblique part of the process. Nevertheless, getting your report to appear just so on the printed page can be tricky. If your report entries are one character too wide for the space allotted, for example, a single letter or number moves down to the next line. Page breaks are another source of frequent trouble. There's no substitute for a little experimentation here. Use small files, or small sections of files, and crank out a sample report several times, tweaking it each time to get a feel for what works and what doesn't.

REUSABLE REPORTS Comfortable with the basics? Then it's time to begin saving the fruits of your labor so you can use them again. Boilerplate report formats, like boilerplate documents or spreadsheet models, can save you a lot of time. By saving report designs, you can quickly run off a report as often as updated information demands. The result: fast, fresh copy—ideal for weekly or monthly reports.

Nearly all data base programs enable you to save for repeated use at least some of the report formats you produce. When you save report formats, you typically save everything that went into their creation: column positions and headings, titles, headers, footers, page size, spacing, number of copies, and more.

Some programs distinguish between one-time report formats and their reusable kin. With Professional File, for example, a report design is temporary unless you specify otherwise. File lets you save up to eight formats for each of its three report types. Once you've saved a report format in File, you can retrieve it from a list of saved formats.

Suppose you require a weekly list of new customers and the size of their orders, and you want to create a standard format for such a report using File. Selecting "report" from the main menu and "print list" from the menu that follows gets you to the list format screen, where you can begin to design your report. Here, you must decide which fields from your records you want to include as columns in your report and how they should be ordered. You do so by putting a column number next to some or all of the fields appearing on the screen; but with File, these numbers are for sorting priority as well as for location on the page. File sorts column one first, column two second, column three next, and so on. (Sorting is alphabetical unless you specify otherwise.)

To create a report format that chronicles daily activity and sums up the week's orders, you might choose the "date" field for column one, "salesman" for column two, "customer" for column three, and "amount" for column four—omitting the other fields in your data base records for this report. Because the "date" and "amount" columns are to be filled with numbers, you should put an "N" next to their column numbers to treat these entries numerically. You might also place a "C" in the "customer" field to count the number of entries in this column and perhaps a "T" in the "amount" field to calculate the sales total. Finally, you might throw in an "A" beside the "T" to compute the average amount of each sale. Choose "Save format" from the Formats menu and give your new report design a name. When you want to use it again, select "Get format" from the same menu, choose it by name from a list of your saved formats, and your settings pop onto the screen. From there, you need only fill in the "search form" to tell File which records to include in the report and a pair of "options" screens to alter printer settings or add niceties like headers

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SERVICE CALL REPORT LOG

CALL RECEIVED	CALL PR
Date / /	Date /
Time: am/pm	Time:

Customer Informati

COMPANY: | Accou
LOCAL ADDRESS: Street No. Zip Code | Phone
Reason

PURCHASE REQUISITION

(not a purchase order)

Requisition No
Confirmed wit

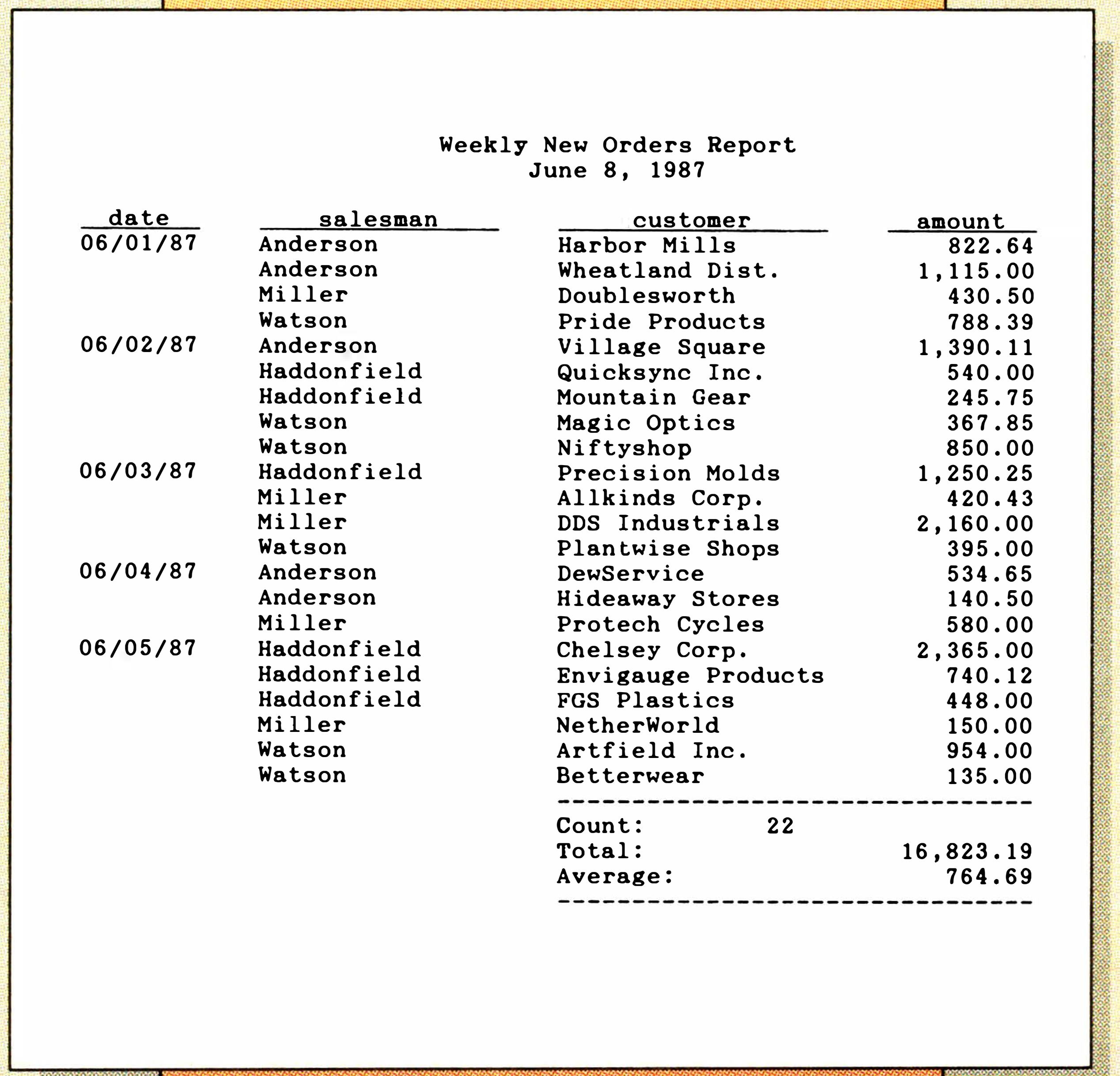
Project Title & No: | Date: | Su
Ext:
Division: | Requester:
Reason for Request:
Dept. No: | Acct. Code: | Date Req:
Deliver To:
Requester Signature:
Mgr: ☐ r: ☐ VP:
Item | De ion | Mfr

and footers.

With the virtues of reusable reports in mind, it may be a good idea to develop general purpose formats to call upon in a crunch. One such report might contain a straightforward listing of names and addresses sorted by last name. You might call it MAILLIST and use it to produce a desktop reference sheet or mailing labels. Another general purpose report might show customer names and unpaid balances. Still another might issue a printout of all regional salespeople who met or exceeded their monthly sales goal.

General purpose formats, depending on the program you use, may or may not be able to search through and sort out your data base each time it prints a report. But even if they can't, you can couple one of your GP formats with one of your saved search routines to make reporting an easy two-step process. Keep your GP formats as broad as propriety allows, avoiding, perhaps, specifics like a report title and summary text. You might relegate these items to a cover sheet created with your word processing software.

FORMATS



```
                    Weekly New Orders Report
                          June 8, 1987

  date        salesman          customer                amount
06/01/87   Anderson          Harbor Mills              822.64
           Anderson          Wheatland Dist.         1,115.00
           Miller            Doublesworth              430.50
           Watson            Pride Products            788.39
06/02/87   Anderson          Village Square          1,390.11
           Haddonfield       Quicksync Inc.            540.00
           Haddonfield       Mountain Gear             245.75
           Watson            Magic Optics              367.85
           Watson            Niftyshop                 850.00
06/03/87   Haddonfield       Precision Molds         1,250.25
           Miller            Allkinds Corp.            420.43
           Miller            DDS Industrials         2,160.00
           Watson            Plantwise Shops           395.00
06/04/87   Anderson          DewService                534.65
           Anderson          Hideaway Stores           140.50
           Miller            Protech Cycles            580.00
06/05/87   Haddonfield       Chelsey Corp.           2,365.00
           Haddonfield       Envigauge Products        740.12
           Haddonfield       FGS Plastics              448.00
           Miller            NetherWorld               150.00
           Watson            Artfield Inc.             954.00
           Watson            Betterwear                135.00
                             ---------------------------------
                             Count:         22
                             Total:                 16,823.19
                             Average:                  764.69
                             ---------------------------------
```

By saving and recalling your report formats, you can quickly generate weekly or monthly updates. This report, drawn from a report design saved in PFS: Professional File, counts orders, totals their value and figures the average.

MACRO MATTERS Macros can work small miracles on the tedium of data base reporting, taking you from the first to last step in a matter of seconds. A macro, a series of recorded keystrokes that you can play back when needed, is usually assigned to two keystrokes, such as Alt-C, that are otherwise meaningless to the program you use. You can use macros to type in text, to issue program commands, or to do both.

Naturally, macros can be used in many applications to expedite many different tasks. But macros are particularly alluring tools when you're faced with a repetitive job that calls for a lengthy sequence of commands or keystrokes—a fitting enough description of what it takes to generate many data base reports. Some data base programs, Professional File and Q&A among them, include the necessary provisions for building macros of your own. Others, such as dBase III Plus and Alpha/three, do not include macro capabilities. But you can add macros to any program with utility software such as Keyworks, SuperKey, or ProKey.

Most programs with macro functions enable you to create macros by simply recording your keystrokes as you go. Many macro utility programs now work the same way, though some insist you write the macros out as a string of characters and commands. In either case, macros empower you to customize and streamline data base reporting.

A comprehensive macro can bring all of the elements in a data base report under the umbrella of a single keystroke. With dBase, for example, the process of searching, sorting, and reporting can require a hoard of commands—especially if (as all but very experienced users are apt to do) you're using its system of menus, dubbed the Assistant. Even if you've saved a set of search instructions in a query file and a report layout in a format file, putting the two together to produce a report involves several steps that might easily be incorporated into a single keystroke.

Use dBase with Keyworks, for instance, and you can quickly dispense a report on inventory shortages. Let's assume you've already created a query file that searches for records in which the "quantity" field is less than 100 pieces (quantity < 100). Let's additionally assume you've created a report format that shows—in four columns—inventory part names, quantity remaining, warehouse location, and reorder numbers. Normally, loading the appropriate data base file, selecting an index by which records are sorted, running a query, retrieving a report format, and printing the results through the Assistant's menus requires about a dozen commands.

Keyworks can reduce that inventory report to, say, an Alt-I keystroke. Just pop up Keyworks before you start and tell it to "record a macro." Name the macro Alt-I (or whatever), then start hitting the necessary keys. First, go to the Setup menu, load the inventory data base, and select the index file needed to sort by the part names. Next, narrow the data base with the query file that spots shortages, choosing "query" from the same menu and picking out the correct query file from the list presented. Then go to the Retrieve menu, choose "report," and select the appropriate format file. Execute the command (as prompted) and reply "Y" when asked if the report should go to the printer. Hit any key to get back to the Assistant's menus. Bring up Keyworks again and tell it to "end macro recording." Your keystrokes are dutifully recorded and you can use Alt-I to do all of this from now on. (Just be sure to save your macros in a Keyworks file.)

Some macro programs empower you to create your own menus of macro commands. Keyworks can do it, and so can a few others. With menus, you might combine your dBase reporting macros onto a single menu that pops onto the screen whenever you hit, say, Alt-R (for report). You can design a working menu in which descriptions of your reports—inventory shortage, client list, monthly invoice, mailing labels—appear beside the keystrokes or "hot" keys (Alt-P, Ctrl-X, etc.) needed to set them into motion. Or you can select a macro from the menu, and it will play back just as if you used its hot key. Menus can not only jar your memory, which is no small matter with a dozen or more macros in your repertoire, they can organize the shortcuts you create into distinct sets. You might use one menu and set of macros for a customer data base, a second menu and set of macros for an accounting data base, and a third menu for an employee data base.

Menus of macros are particularly worthwhile when several people require access to the same data base, and one or more of these people is likely to need

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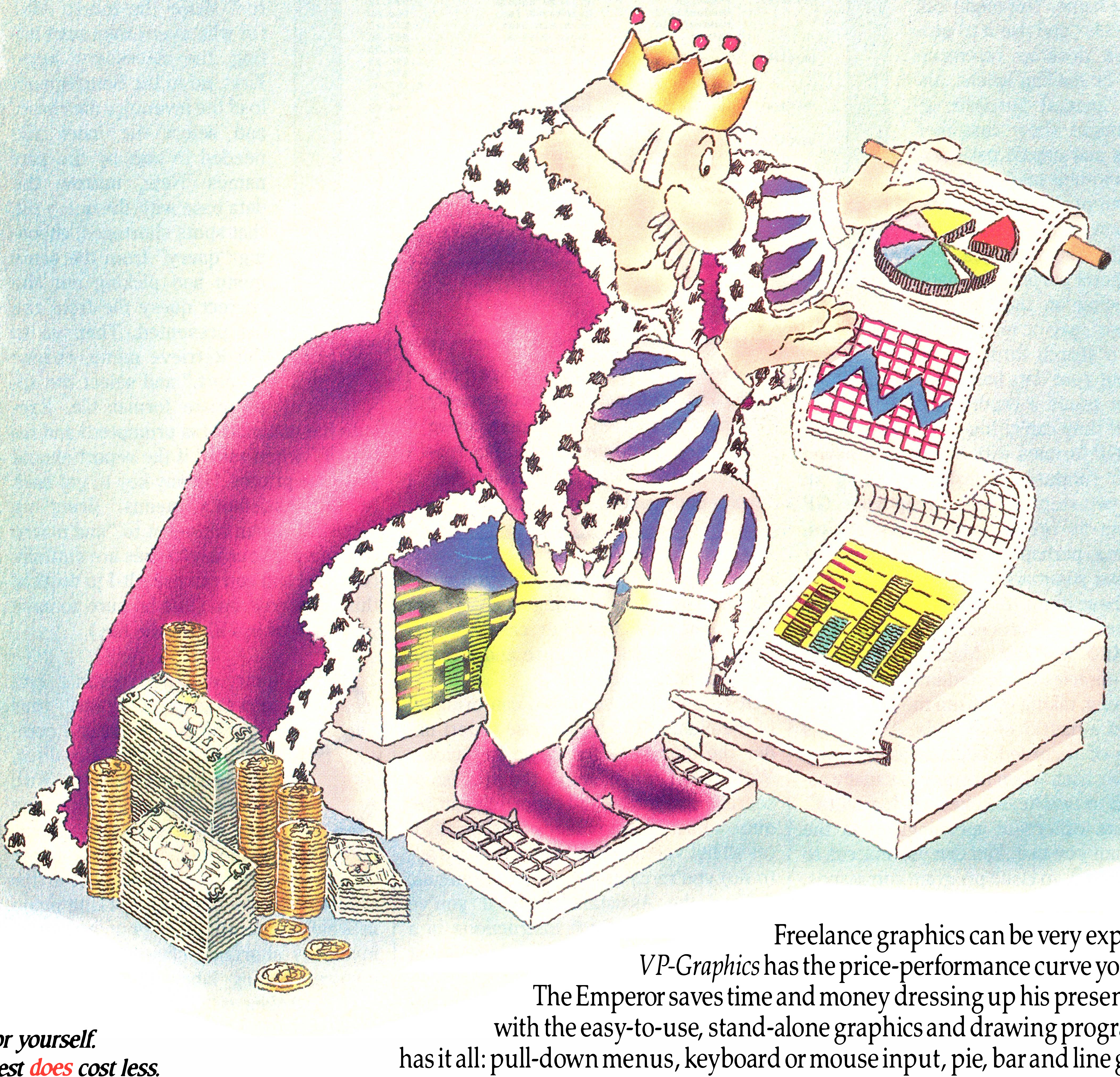

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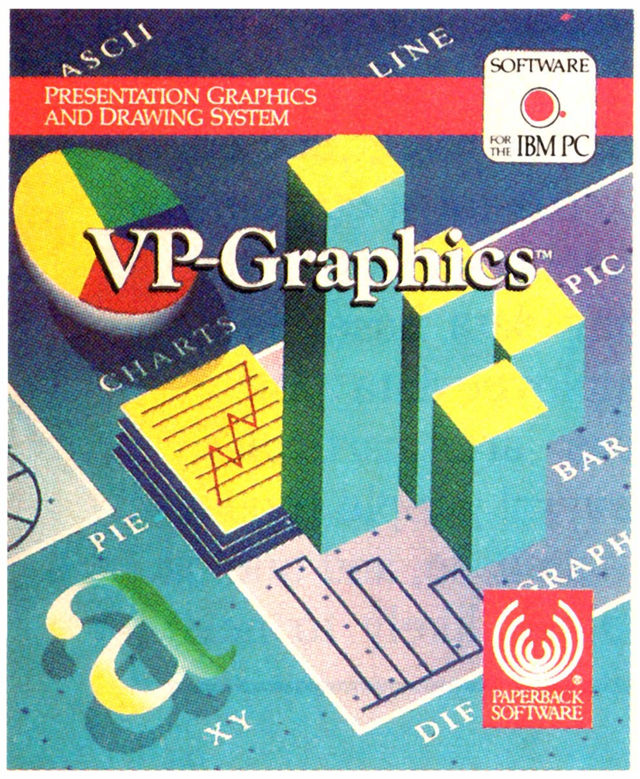
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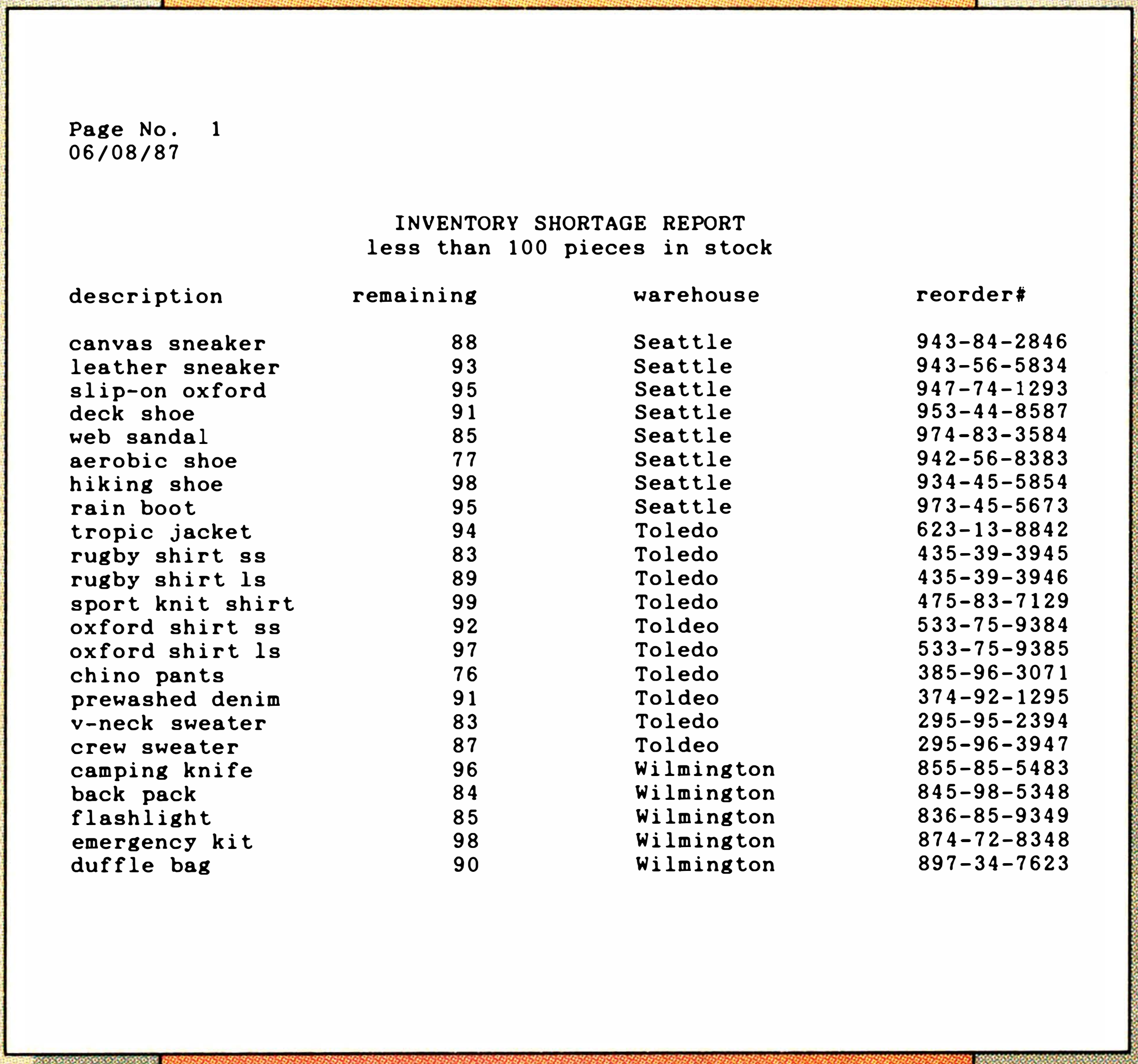
(For More Information Circle 92)

help generating reports. Creating menus that issue report macros enables you, in effect, to prompt others to make the correct choices—whether it's loading in the right file, searching for the right set of records, sorting records properly, arranging fields on the page, or all of the above. You might use a menu for each stage of the reporting process to allow maximum flexibility, providing, say, one menu of available data bases, another of searching and sorting options, and a third of report formats. Or you might simply use a simple menu of standard report macros that perform all of the necessary steps. In either case, you've made the reporting process infinitely clearer and faster for the people around you who know what they want but don't know how to get it out of the data base. With menus, they just choose what they need from the plain-English options you've presented to them. And time not spent fumbling at the computer is always time better spent, resulting in cheerier dispositions if not increased productivity.

MACROS



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Page No.   1
06/08/87


                        INVENTORY SHORTAGE REPORT
                       less than 100 pieces in stock

description          remaining          warehouse          reorder#

canvas sneaker              88          Seattle            943-84-2846
leather sneaker             93          Seattle            943-56-5834
slip-on oxford              95          Seattle            947-74-1293
deck shoe                   91          Seattle            953-44-8587
web sandal                  85          Seattle            974-83-3584
aerobic shoe                77          Seattle            942-56-8383
hiking shoe                 98          Seattle            934-45-5854
rain boot                   95          Seattle            973-45-5673
tropic jacket               94          Toledo             623-13-8842
rugby shirt ss              83          Toledo             435-39-3945
rugby shirt ls              89          Toledo             435-39-3946
sport knit shirt            99          Toledo             475-83-7129
oxford shirt ss             92          Toldeo             533-75-9384
oxford shirt ls             97          Toledo             533-75-9385
chino pants                 76          Toledo             385-96-3071
prewashed denim             91          Toldeo             374-92-1295
v-neck sweater              83          Toledo             295-95-2394
crew sweater                87          Toldeo             295-96-3947
camping knife               96          Wilmington         855-85-5483
back pack                   84          Wilmington         845-98-5348
flashlight                  85          Wilmington         836-85-9349
emergency kit               98          Wilmington         874-72-8348
duffle bag                  90          Wilmington         897-34-7623
```

Using a Keywords macro, the Alt-I keystroke produced this report from dBase III Plus by pairing a dBase query file (culling records with "quantity" fields less than 100) with a simple four-column report format. Macros save keystrokes.

Macros are powerful though easy-to-use tools that can cut through the toil of getting data base information onto paper. Still, there are limits to how much they can do to streamline your sorting and reporting system. This is why programs like dBase III Plus and R:base System V include their own programming languages. These pet languages give you the power to construct specific applications—covering everything from data entry to reporting—that meet your precise requirements of a data base. Essentially, they enable you to take a one-size-fits-all product and transform it into something that works as if developed solely for your needs. And that, of course, can save a great deal of time.

Data base programming is by no means a casual pursuit, however. It is less arcane than conventional programming, to be sure, but it nonetheless demands an amount of time and acuity of logic most people find too consuming. Want to try your hand at it? Then you might want to check out one of the "program generators" available for dBase III—Quickcode is one such utility—or the built-in "application express" system of R:base 5000 and System V. These application helpers can get you started with a minimum of fuss.

HARDWARE HELPERS There is a lot of talk about processing speeds and disk access time and printer characters per second or pages per minute. Issues of speed matter a great deal to people managing data base files with hundreds or thousands of records, many of whom routinely wait 10, 15, and 20 minutes or more for their programs to search and sort through information.

Data base software has an insatiable appetite for speed. Faster processing speed (in megahertz or MHz) can make a real difference, as anyone who has switched from an IBM PC to an IBM AT can attest. Accelerator ("turbo") expansion boards can add some zip without requiring you to replace your existing system. A superfast hard disk drive can show an even more noticeable improvement. Data base programs typically shuttle information in and out of memory from the disk as necessary, a process which makes managing enormous files possible within limited memory space, but one which also makes an operation like searching out records run much slower. The faster your hard disk accesses information, therefore, the faster your data base program can filter through it.

A hard disk's "access time" is measured in milliseconds (ms); the lower the number, the faster information is retrieved. Access times between 40ms and 65ms are good, with times under 40 being excellent. (Measures in the 20s are becoming common, and a score as low as 10ms has been achieved.) Many of the fastest hard disks, it seems, are available only as part of complete systems, usually expensive setups such as an IBM PC AT or Compaq 386. But you can upgrade to a speedy hard disk drive without supplanting your entire system. Plus Development and Core International are among the handful of suppliers who specialize in fast add-on hard disks. Is it worth the extra dollars?

If you're dealing in a few hundred records or less, and the hard disk you're using now isn't a real dog (more than 100ms), probably not. But if your record count is in the thousands and growing, it is money well spent. Not only can the speedier hard disk streamline lengthy searching and sorting routines, it may defer for some time the impulse to make a wholesale upgrade—especially if data base management is your primary task.

Printing speed, for those who often generate lengthy reports, can be another important factor. Rather than trade in your printer for a faster model, though, you might try a larger print buffer. Computers usually feed information to printers faster than they can print it, and a print buffer holds whatever surplus it can. Most printers include a buffer of 2,000 to 8,000 characters—with an option to plug in more buffer memory. You can also buy external buffers that cable between the computer and printer. Some buffers hook up several computers.

Hardware purchases are expensive medicine for minor ailments, but they are worth considering as the breadth of your data base work widens and the reporting process begins to crawl.

Saving report formats, devising macros, and upgrading hardware probably won't free you entirely from the time-consuming process of creating reports from scratch. You'll have to rethink matters as special circumstances arise. But these shortcuts, when combined with a firm grasp of the searching and sorting basics, can make much of your report issuing a swifter, more precise and less arduous task. ■

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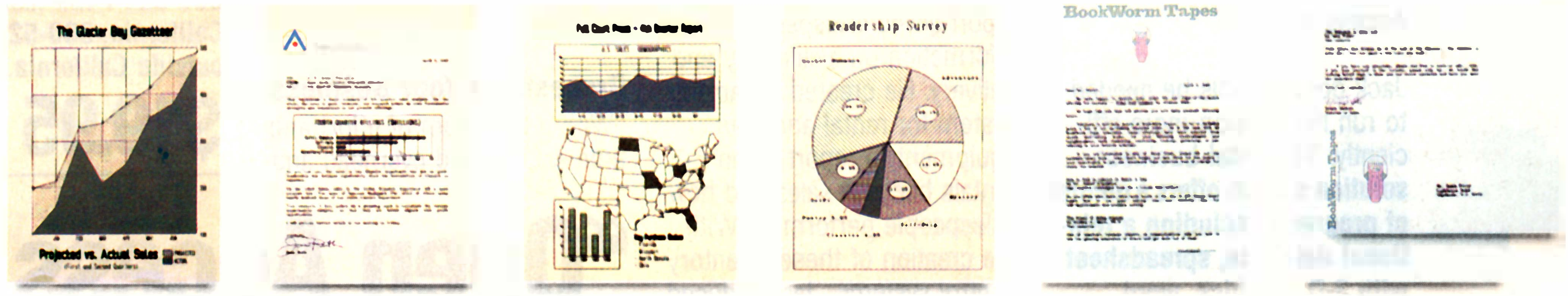

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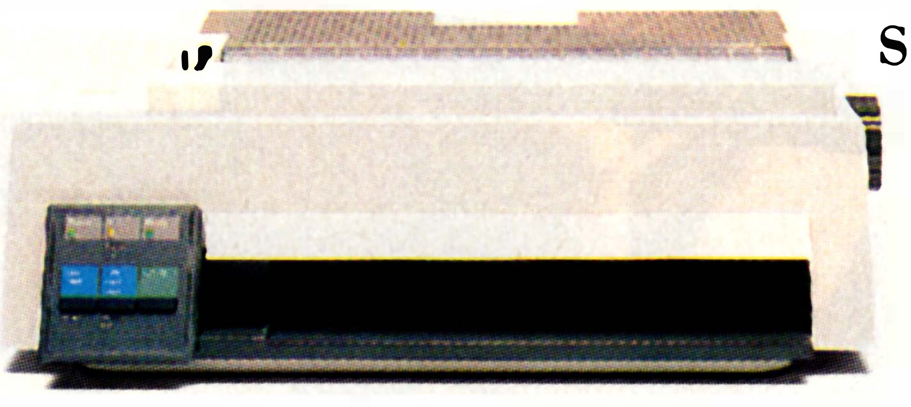

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The IBM Proprinter X24 and Proprinter XL24 are new. The "24" stands for 24-wire technology. What *that* stands for is new levels of Proprinter quality for everything you put on paper.

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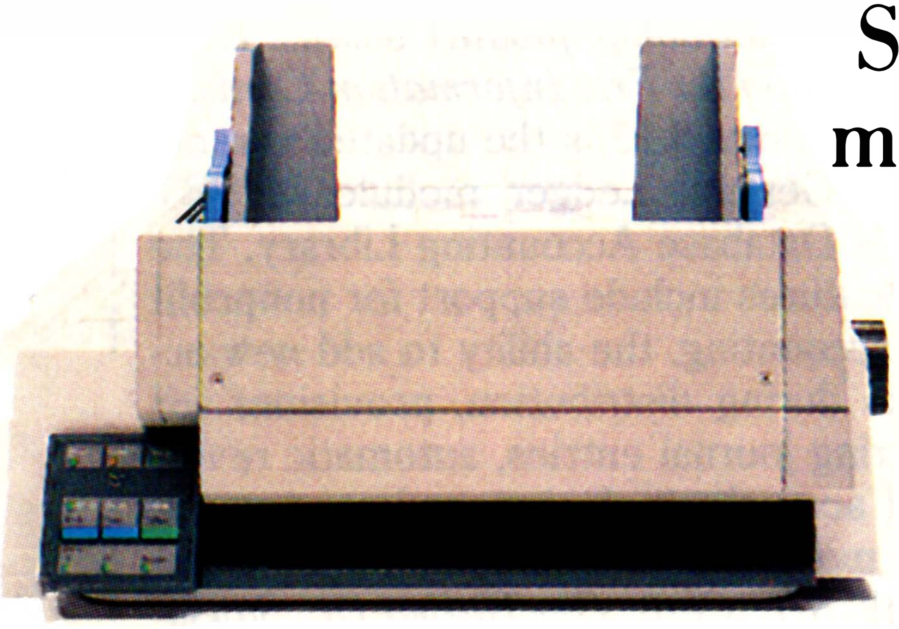
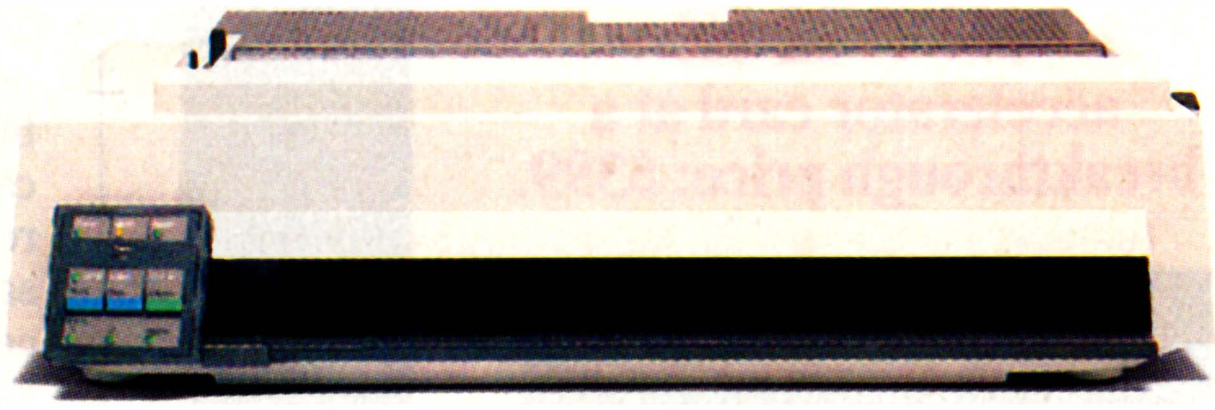


The IBM Proprinter X24 with optional sheet feed.



The IBM Proprinter XL24 has a wide carriage, ideal for spreadsheets.

The Proprinter XL24 has a wide carriage for spreadsheet printing, and both have an optional sheet feed for added paper-handling convenience, plus FontSet,™ an option that lets you choose from 11 other typestyles.

The IBM Quietwriter III Printer.

Earlier IBM Quietwriter printers have always been easy on the ears, but the new IBM Quietwriter III Printer is even quieter and goes nearly twice as fast, printing executive letter quality text and graphics in an executive hurry.

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There's also a new dual-drawer sheet feed (with optional envelope feed) that lets you use letterhead stationery for the first page of a letter, then plain paper for the rest.

No matter what level of price or performance you need, there's an IBM personal printer to fit the bill. And they fit very nicely with the IBM Personal System/2.™

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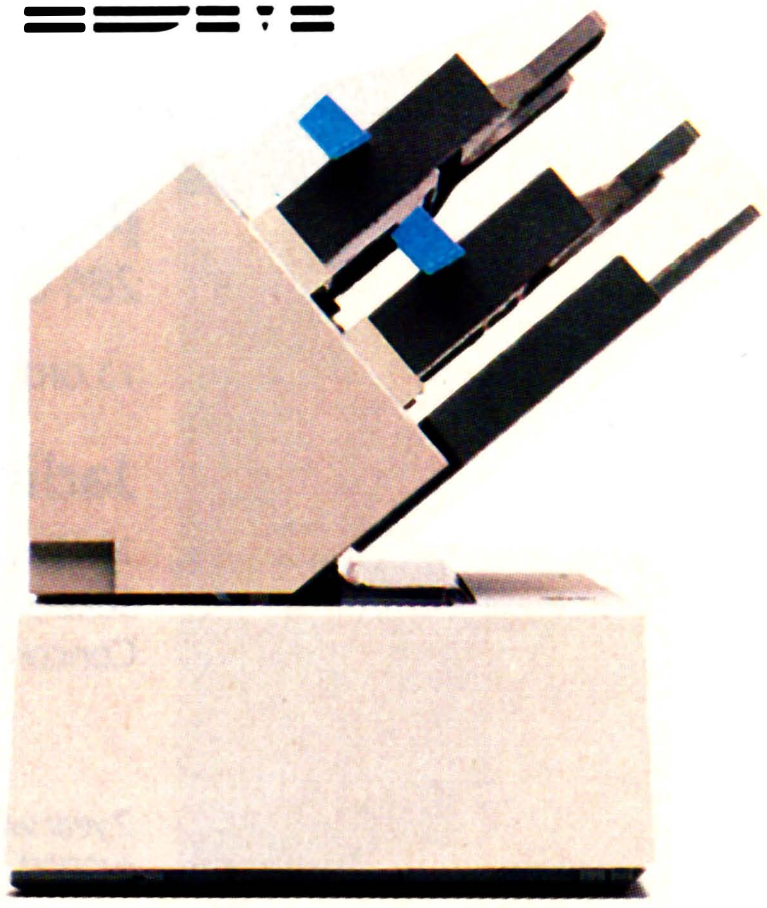
The IBM Quietwriter III Printer with single-drawer sheet feed.



There's also an innovative multiple-drawer sheet feed.

*Based on an independent evaluation using *PC Magazine* Labs Benchmark Series.

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COMMUNICATING...

RAM-resident communications software can help you make your on-line routines more lucid and slash the time you spend making the connection.

by Patrick Honan

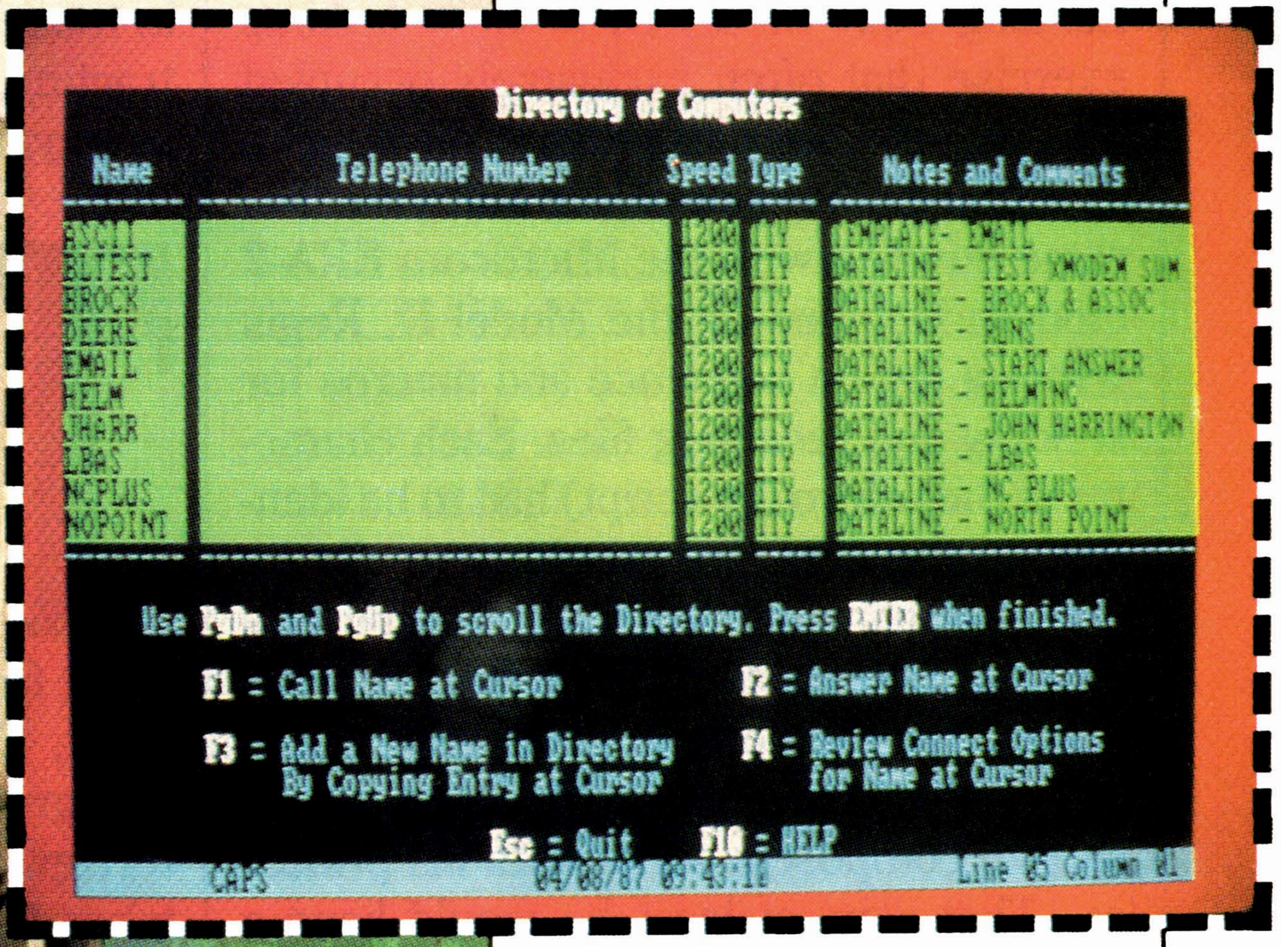
There was a time when everyone drove standard shift automobiles. Then an engineer decided to make driving easier by getting rid of some of the manual aspects of car transmissions. No more clutching. No more shifting gears. No more stalling as gears were shifted. With automatic transmission, driving became more productive, even enjoyable, as drivers were able to concentrate on the act of negotiating the road—and not on groping for the stick-shift lever.

Communications software packages that work in the background are the automatic transmissions of electronic communications. For years, eager electronic communicators have made do with communications packages that work in the foreground—that is, as the main software application. But some software manufacturers decided communication is easier and more productive when it operates in the background—letting you log on to an on-line service or bulletin board and perhaps transfer a file while you continue to work on a spreadsheet, for example. These RAM-resident communications programs don't merely hibernate in the background until you "hot key" into them. You can automatically set these packages to send or receive files at predetermined times, even if you're miles away from the computer. As the communications session is set in motion, you are free to continue working on your word processing document, spreadsheet, or data base.

It is true that most foreground communications packages, such as Smartcom and Crosstalk, can be set to dial an on-line service, mainframe, or company bulletin board at preset times. You can create a macro or script to log on to a service, send or receive a file, communicate with a mainframe, or perform any other communications task. You can run the communications program and another application simultaneously with the multitasking Desqview from Quarterdeck Office Systems, for example. But no matter how much you automate the process, the communications session must be in the foreground.

That was the exact problem faced by Bob Regis, a senior systems analyst for the Fairbanks Weighing Division of Colt Industries—a manufacturer of industrial scales—when he attempted to develop a more efficient method for the company's home office in St. Johnsbury, Vt., to communicate with its 34 field offices scattered throughout the United States.

...IN THE



```
                       Directory of Computers
Name       Telephone Number          Speed Type   Notes and Comments
-------    -------------------       ----- ----   ------------------------
ASCII                                1200  TTY    TEMPLATE- EMAIL
BLTEST                               1200  TTY    DATALINE - TEST XMODEM SUM
BROCK                                1200  TTY    DATALINE - BROCK & ASSOC
DEERE                                1200  TTY    DATALINE - RUNS
EMAIL                                1200  TTY    DATALINE - START ANSWER
HELM                                 1200  TTY    DATALINE - HELMING
JHARR                                1200  TTY    DATALINE - JOHN HARRINGTON
LBAS                                 1200  TTY    DATALINE - LBAS
NCPLUS                               1200  TTY    DATALINE - NC PLUS
NOPOINT                              1200  TTY    DATALINE - NORTH POINT
-------    -------------------       ----- ----   ------------------------

      Use PgDn and PgUp to scroll the Directory. Press ENTER when finished.

         F1 = Call Name at Cursor                  F2 = Answer Name at Cursor

         F3 = Add a New Name in Directory          F4 = Review Connect Options
              By Copying Entry at Cursor                for Name at Cursor

                          Esc = Quit     F10 = HELP
    CAPS                  04/08/87 09:43:10                    Line 05 Column 01
```

WAVES OF GRAIN: Cheri Mullen, an assistant market analyst for an agricultural commodities news service, once used Hayes' Smartcom II to collect grain elevator bids and files from five commodities consulting firms. It was a time-consuming task that required her to make calls and then await file transfers. It took her about five minutes to download each file. Now with VM Personal Computing's Relay Gold running in the background (top screen) Mullen checks the program's directory for a list of the incoming file transfers expected to arrive each day.

JOHN NOLLENDORFS

BACKGROUND

The field offices exchange payroll, accounts payable, and other financial data with the home office throughout the day on MCI Mail. Regis or an assistant at corporate headquarters was required to periodically download the messages to a Leading Edge Model D. It was a tedious exercise that often exclusively occupied the computer for more than three hours a day. Using communications software that came bundled with the Microcom ERA-2 modem installed on the Model D, Regis wrote a log-on sequence and macros for sending and receiving files. Each character in the macro (or script) had to be identical to the text that would normally be entered manually from the computer's keyboard. Regis discovered that the most productive method for generating a log-on script was to perform the steps necessary to compose a script with his printer on. That way, at least he would have a printed copy of each character in the script. He was then required to repeat each step while creating the script from within his PC communications software program.

The result was less than satisfactory. When it was time to check for messages or other data, Regis or an assistant still had to exit the application he was working on and start the Microcom communications program. And the computer was still engaged on MCI Mail for several hours each day.

The solution: a background communications package—Lotus Express from Lotus Development Corp. Express automatically checks the mailbox hourly (the most frequent interval that Express can be configured to check a mailbox) and automatically downloads his messages to a subdirectory on the computer's hard disk. Regis created the subdirectory during the software installation process. Neither he nor anyone else at Fairbanks has to enter a command during the working day. What's more, since Regis now telecommunicates in the background, the computer is free to run other applications eight hours a day.

Background packages can save you time even if you don't configure them to automatically send or receive files. You may opt to send a message on a whim. You simply bring the communication package into the foreground (usually using some combination of "hot keys"), complete your communications chores, and return the communications package to the background, where it resides until called up again. With a communications package that only works in the foreground, you would have to save the file you were working on, exit the application program, load the communications package, complete the file transfer, exit the communications package, and reload your application and file. The sheer tedium involved in these repetitious exercises can be distracting, waste precious time, and detract from your productivity.

The minutes saved by background communications add up for Doug Tinning, a computer consultant at Hughes Aircraft in Long Beach, Calif., who uses Get, a $100 background communications program from Cygnet Technologies in Fremont, Calif. "The key factor in using a background program is that it doesn't interrupt the flow of work. Let's say it takes four to five minutes to log on and check your mailbox," Tinning says. "If you log on two or three times a day, you're talking about 10 to 15 minutes of downtime." And the more frequently you transmit or receive messages, the more downtime you save by communicating in the background.

Cygnet recently released version 2.0 of Get. An earlier version operated in the background and would check your mailbox but would not download messages. If messages were present, the program merely placed a message on the screen informing the user that he had "mail waiting." The updated version of Get will now download waiting electronic mail to the user's computer.

There are few operational shortcomings to using a background package in lieu of a program that works only in the foreground. The features in both types are basically the same, although most background packages give you more flexibility and, in general, are less expensive. DeskTalk ($60), from Advanced Logic Systems, Sunnyvale, Calif., is the most inexpensive background program available today. It offers basic background communications features in addition to a notepad and a Rolodex-like card file. At the other end of the spectrum is Relay Gold ($250), a powerful personal-computer-to-mainframe and PC-to-PC package from VM Personal Computing of Danbury, Connecticut. (The company also markets Relay Silver, intended for people who don't need to access mainframe information.)

Perhaps the most important consideration when shopping for a background package is to find one that is suited for the type of communications you do. Lotus Express, for example, works solely with MCI Mail. Get works with a variety of on-line services including AT&T Mail, GTE Telemail, MCI Mail, EasyLink, Dialcom, The Source, CompuServe, and GE QuikComm. If you require the ability to communicate with another personal computer, a terminal, or a mainframe, you should consider a package such as Relay (Silver or Gold), Backcomm from LaSalle Micro in Schaumberg, Ill., or Softerm PC from Softronix in Colorado Springs, Colo. These programs enable you to communicate with on-line services and bulletin boards.

It was her time-consuming daily computer-to-computer file transfer process that caused Cheri Mullen to switch from Hayes's Smartcom—a foreground program—to Relay Gold. Mullen is an assistant in the marketing analysis department of Dataline, Inc., a farming and commodities news service in Omaha, Neb., that broadcasts continuously on an FM sideband channel. She spends most of her afternoons making calls to collect grain elevator bids. But she also receives files from five consulting firms that provide Dataline with recommendations and predictions on the commodities exchange. While she was using Smartcom, the process of receiving the files was as follows: Each firm would call her on the phone to alert her that it was ready to send files. Mullen would exit her software program, load Smartcom on her IBM PC XT, then wait while the files were sent. It took about five minutes for each company to transmit its files. There was also a glitch somewhere in the file transfer process that caused the document's margins to be too large for the screen. So Mullen had to reset the margins on each file.

Because Relay Gold runs in the background, the consulting firms no longer call Mullen before sending the files. Relay Gold downloads the files into a directory on her hard disk. Mullen checks the directory in the late afternoon to see if all the files were received. Relay Gold receives the files with the proper margins, so Mullen doesn't have to spend time reformatting each file.

Once you've chosen the right package for your communication needs, make certain that your personal computer is properly equipped. A battery-powered clock/calendar is a definite requirement. Your software won't know when to place a call in the background without one. You could conceivably set the time and date every time you boot up your computer, but that

```
MAIL CHECKING TIMES

        Mail Checking Times                Time Specification Methods

        When GET! is loaded.               Check at Specific Time(s)
        7:00 am        9:00 am             Check at Periodic Times
        7:30 am       10:00 am             Not Checked At Load Time
        8:00 am        1:30 pm             Delete Specific Time(s)
        8:30 am        4:00 pm

Use ↑ & ↓ to highlight your choice, then press ↵.
```

5 Undo Last
8 Undo
9 Done
10 Help

KEN BANKS

GETTING IT ON TIME: Julia Shy, an executive secretary for the vice-president and controller at Hughes Aircraft, uses Cygnet's Get communications program to cut across international time zones and retrieve messages from managers at a subsidiary in Scotland. Before she was able to set Get (top screen) to retrieve messages at the beginning and end of the day, Shy was forced to stop her budget-tracking tasks and exit Lotus 1-2-3 to check for incoming messages.

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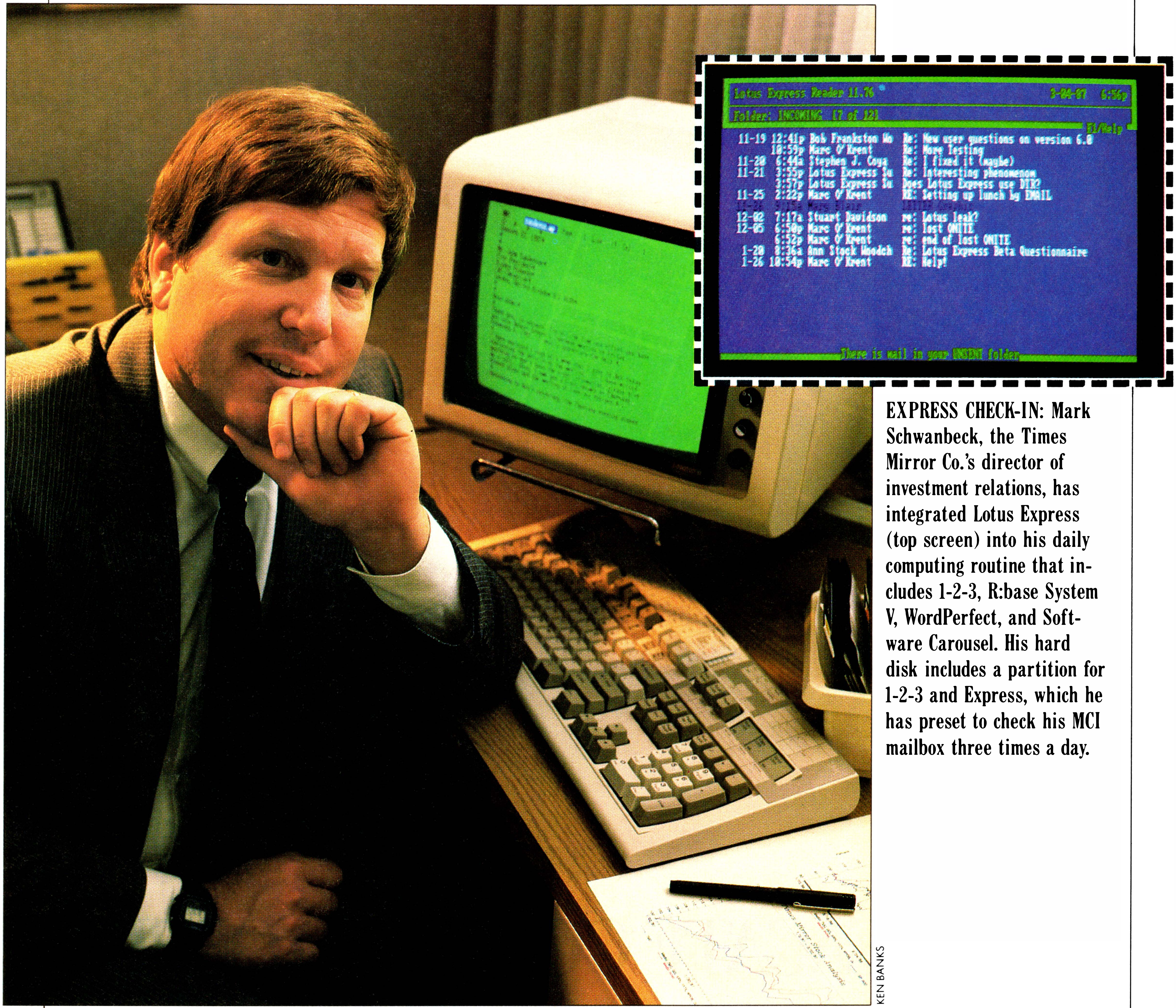


```
Lotus Express Reader 11.76                                3-04-87  6:56p
Folder: INCOMING  [7 of 12]
                                                                 F1/Help
 11-19 12:41p Bob Frankston Wo  Re: New user questions on version 6.0
       10:59p Marc O'Krent      Re: More Testing
 11-20  6:44a Stephen J. Coya   Re: I fixed it (maybe)
 11-21  3:55p Lotus Express Su  Re: Interesting phenomenon
        3:57p Lotus Express Su  Does Lotus Express use DTR?
 11-25  2:22p Marc O'Krent      RE: Setting up lunch by EMAIL
 11-26  9:15a Mary Blair        LETTER Graphic
 12-02  7:17a Stuart Davidson   re: Lotus leak?
 12-05  6:50p Marc O'Krent      re: lost ONTIE
        6:52p Marc O'Krent      re: end of lost ONTIE
  1-20  8:36a Ann Stock Woodch  Re: Lotus Express Beta Questionnaire
  1-26 10:54p Marc O'Krent      RE: Help!

              There is mail in your UNSENT folder
```

KEN BANKS

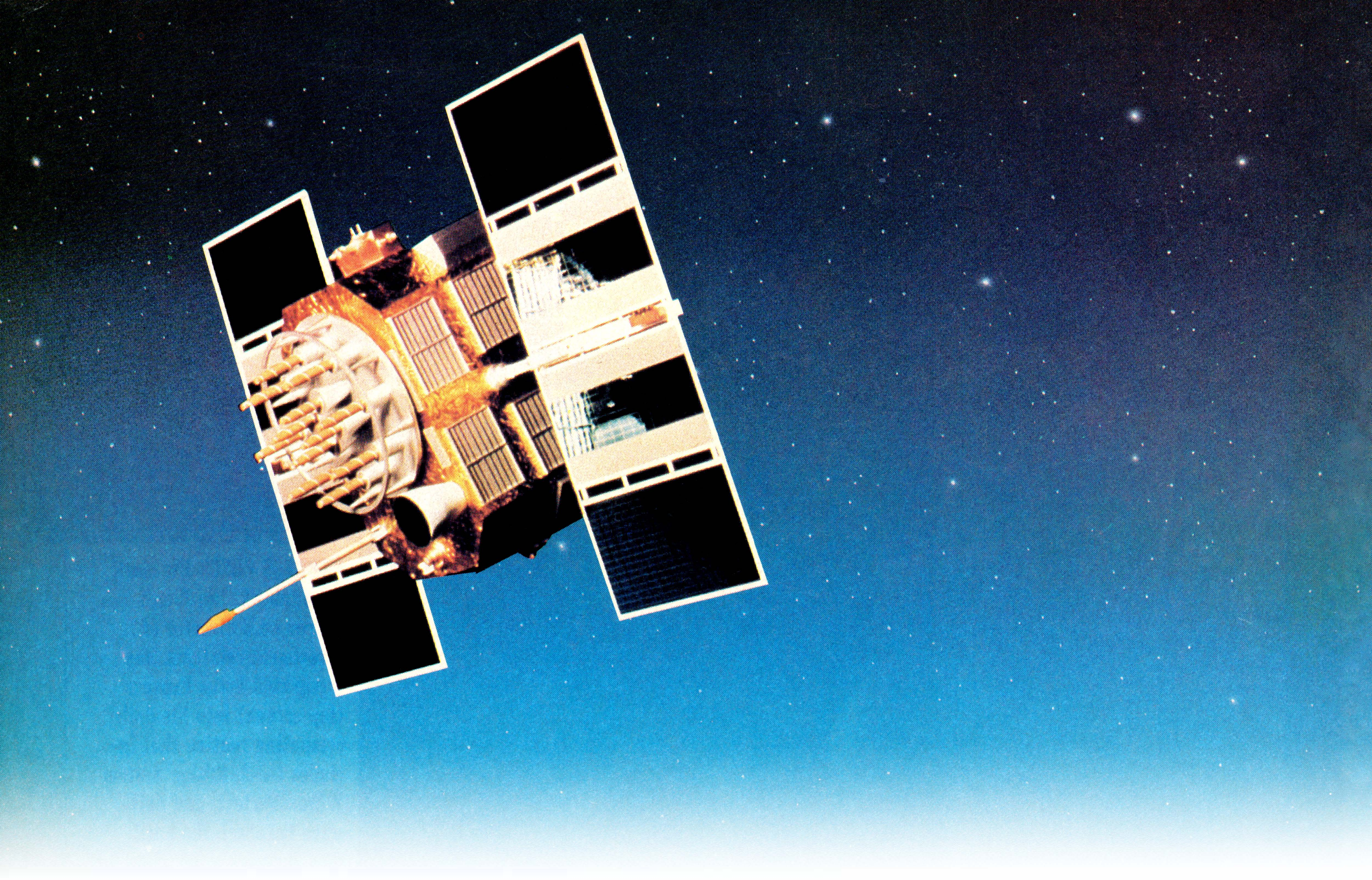
EXPRESS CHECK-IN: Mark Schwanbeck, the Times Mirror Co.'s director of investment relations, has integrated Lotus Express (top screen) into his daily computing routine that includes 1-2-3, R:base System V, WordPerfect, and Software Carousel. His hard disk includes a partition for 1-2-3 and Express, which he has preset to check his MCI mailbox three times a day.

manual exercise is exactly the sort of operation you are trying to eliminate. Background communications programs will work on a computer that has two 5.25-inch disk drives, but a hard disk is recommended. The communications program must be in one drive, leaving you a single drive for your application. There is precious little room on the communications disk for storing downloaded messages. Make sure you have sufficient RAM for both the communications program and the foreground application to coexist. Get takes up about 100k of RAM, for example, and Relay Gold and Backcomm each consume about 192k of RAM.

With 640k of conventional RAM and 1.5Mb of expanded memory on his IBM PC AT, it certainly would appear that Mark Schwanbeck has enough memory to use Lotus Express comfortably. Appearances are deceiving. Schwanbeck, the director of investment relations at the Times Mirror Company in Los Angeles, Calif., uses Microrim's R:base System V data base, which swallows 512k of RAM. At other times, Schwanbeck uses Office-Writer from Office Solutions, Inc., in Madison, Wisc., and Lotus 1-2-3 for word processing and spreadsheets, respectively. Schwanbeck also uses a utility program called Software Carousel marketed by SoftLogic Solutions in Manchester, N.H., to make optimum use of his RAM and switch quickly among software applications. Software Carousel enables him to swap applications in and out of RAM with a single keystroke.

He spends much of the time working in the partition containing Express and 1-2-3. He sets Express to check his mailbox three times a day. Express is not active when he is in another partition, but the program checks the computer's clock when he reloads the partition that contains Express. The program then checks Schwanbeck's MCI Mail mailbox if it is past the preset time he's instructed the program to log on.

Some programs enable you to reduce the amount of RAM needed by eliminating or scaling back features. Get, for example, uses a maximum of 105k, but you can reduce the size of the program's sim-



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(For More Information Circle 29)

ple text editor and log-on sequences (scripts) so that Get needs as little as 50k. The text editor enables you to write messages from within the communications program rather than in your word processor or while on-line. Consider the size of the files you usually transmit and adjust the size of the text editor accordingly. The minimum size of Get's text editor is 8k. A script is a macro that contains the log-on routine or other commands for the device or on-line service you're communicating with.

Look for a package that has a preformed script for the service you use. A preformed script lists a service's on-line prompts— all you have to do is fill in the blanks, such as your name and password. Tinning of Hughes Aircraft uses the preformed scripts in Cygnet's Get to access AT&T Mail, Telenet Communications, and PROFS, the internal corporate electronic mail system marketed by IBM.

What makes it tricky? Get includes a menu of 24 commands that you can choose from when creating a script. The problem, Tinning says, is that some of the commands combine several tasks, but the different tasks within a command are not apparent from the name of the command, and the commands aren't clearly explained in the manual.

Regardless of how clear the commands from which you create a script are, creating a script from scratch can often be a complicated procedure. You have to recreate each prompt, command, and response exactly as it would appear if you were using the package in the foreground. Punctuation and capitalization must be the same. You may have IF/THEN or other conditional statements, depending on how direct the process of sending or receiving messages is.

Creating a script needn't be at all tricky if the package has a learn mode. This mode captures your keystrokes, creating a script as you type. Relay Gold's learn mode, for example, is turned on from the keyboard by hitting Alt-L after you start up the package in the foreground and log on manually. The program then records your keystrokes and saves them in a file that has an .SCR extension. It will then automatically search for the corresponding script each time you log on.

With a package that does not have a learn mode, perform the procedure manually once, printing out the steps as you go. Then you can refer to the printed version to make sure you've got all the steps correct.

Scripts are one ingredient in setting up a background package to regularly help you with your regular communications chores. The second ingredient is scheduling: How much flexibility do you have in setting up the times for the program to dial? Go through your daily routine to find out what the peak times for sending and receiving messages are. Maybe you receive a substantial barrage of messages in the morning but almost none in the afternoon. If that's the case, set your background package to check your mailbox more frequently during the peak times.

Julia Shy, an executive secretary for the vice-president and controller of the Industrial Electronics Group at Hughes Aircraft, uses Get to receive messages from managers at the company's subsidiary in Scotland. Most of Shy's messages come in at the beginning of her day—the end of the working day in Scotland. She sets Get to check her GTE Telemail mailbox every half hour from 9 a.m. until 11 a.m. Pacific time and every two hours during the rest of the day.

Before using Get, Shy would often have to interrupt the budget tracking she does on 1-2-3, for example, to check her mailbox if she was waiting for an important message. Get puts a message in the corner of her screen telling her it is checking the mailbox and then puts another message on the screen if a message is received.

Stanley Pickett had to work out such a schedule for two packages of Lotus Express, one installed on a Compaq Deskpro 286 in his office and the other installed on an IBM PC at home. Pickett is the president of the American Language Academy in Rockville, Md., an organization that teaches English to people who have recently immigrated to the United States. The employees at the academy's headquarters and at nine other branches throughout the country communicate electronically on MCI Mail.

Pickett has set his office copy of Express to check his MCI Mail mailbox at the beginning of every hour (the most frequent schedule to which Express can be set) from 8 a.m., when he usually arrives, until 7 p.m., when he generally leaves the office. As part of the menu-driven installation procedure, he set how often he wanted Express to send or receive messages and what portion of his hard disk he wanted messages downloaded to. "When I first got it [Express] I thought an hour was a long time [to wait]," Pickett says. "But an hour has proved to be enough time," given the volume of messages he receives. If Pickett needs to check his mailbox more frequently, he "hot keys" into Express, connects to MCI Mail, checks his mailbox, exits, and then "hot keys" back into his application. Pickett does not set the Express copy at his home to check his mailbox—there's no need to set it during the day, and he finds the volume of messages at night is not enough to require him to preset Express. He does keep Express resident when he's home and simply "hot keys" into it to have Express check his MCI mailbox.

All of the background PC communications packages mentioned here will redial an on-line service, bulletin board, or mainframe computer if they receive a busy signal. The software and modem can't work if the power is off, but the program will read the computer's clock when the power comes on again and will dial at the next checking interval.

You don't have to sacrifice confidentiality when you are communicating in the background. Lotus Express, for example, does not display your password or user identification number in its scripts for on-line services. The information is there for the program to use but not for someone else to discover and misappropriate. With Backcomm you are able to assign yourself a password. The program will prompt you for the password (you're allowed three tries) each time you try to load Backcomm. You can also assign a password to others who are using Backcomm on your computer. After you've specified the password for other users, you can select the access they have.

In general, the features of most background communications programs are essentially the same. All reside in RAM, enable you to run another application software program at the same time, and can be set to send or receive files. Look for additional features you may need that are specific to programs, such as a simple text editor, the ability to move between subdirectories, and print files. Relay Gold, for example, enables you to send and receive electronic messages at the same time. VM Personal Computing, the publisher of Relay Silver and Gold, maintains a bulletin board that users can call to receive fixes, called Zaps, or updates to the company's software. LaSalle Micro, the maker of Backcomm, does the same.

Perhaps you subscribe to the adage, "If it ain't broke, don't fix it." If the method you're currently using to communicate electronically works for you, you'll probably want to stick with it. Background communications, however, offer greater power and flexibility than foreground packages, regardless of how often you go on-line. ■

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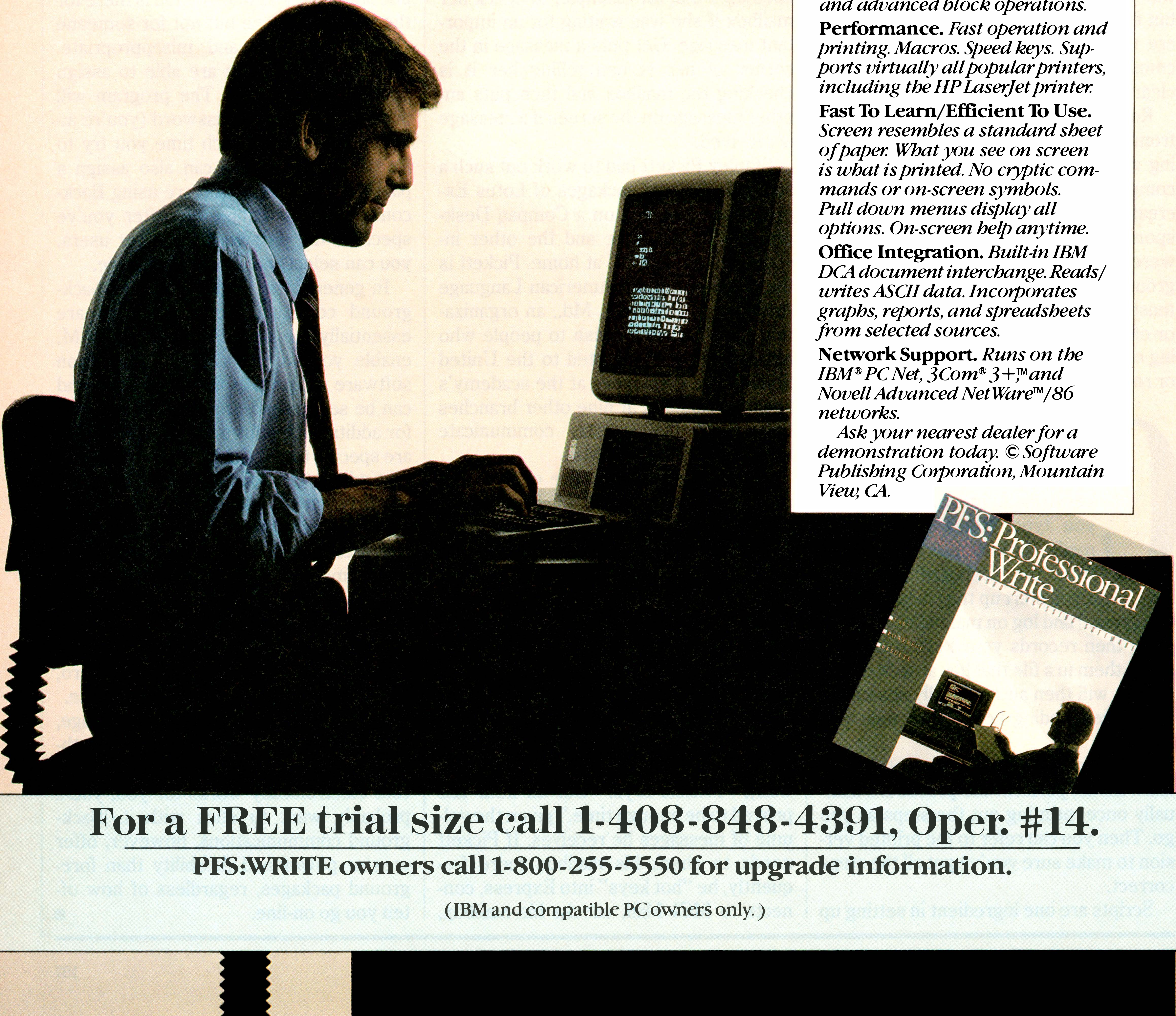

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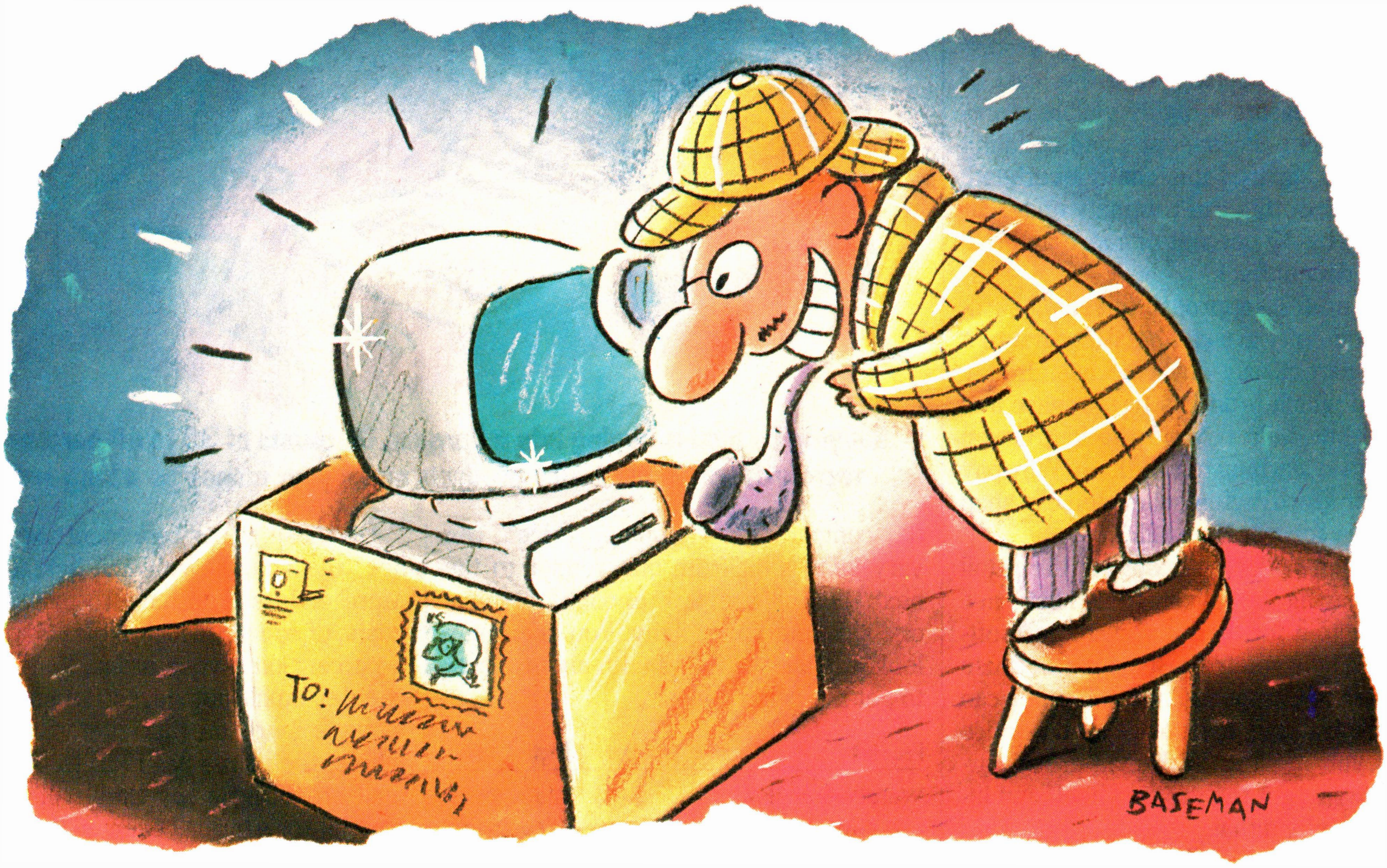


GARY BASEMAN

Mail order isn't for everyone. But if you know what you want, buying by mail can make computing much more affordable.

by Christopher O'Malley

Perhaps it all sounds a little too good to be true. Lotus 1-2-3, dBase III, WordPerfect, and a variety of best-selling software sell for about half their suggested retail selling prices. But wait, there's more: printers, monitors, hard disks—even entire computer systems. They, too, go for far less than the asking prices down at the computer store on the corner.

Where is this haven from high-cost computing? Mostly in the pages of magazines like this one, where a handful of companies offer computer hardware and software through the mail at significant discounts. Their names may not sound familiar; no one will mistake Computer Discount Warehouse for a ComputerLand. Most of their wares, however, are products from many well-known and trusted sources such as IBM, Epson, Microsoft, and Borland.

But can these fire-sale prices be for real? Apparently, they can. Millions of dollars change hands every year in the mail order computer business and, for the most part, buyers do get the program

GARY BASEMAN

Buying by mail is buying into a bargain. Discounts of 30 to 60 percent for factory-fresh, name-brand products make your money go a long way.

or peripheral they seek at 40 or 50 or 60 percent off the retail price. It is also true that some buyers get more than they bargain for—more surprises, more foul-ups, more hassles, and more delays than one should have to tolerate. And it is true, too, that a few buyers simply get burned, receiving less than the working goods they were promised, or nothing at all.

Most of the companies selling computer products through the mail are legitimate businesses, and most of their products come from the same factories or distributors as those in retail stores. But by taking your order over the telephone and (usually) charging the purchases to your credit card, a mail order company eliminates many of the operating costs associated with retail selling—not the least of which are leasing a highly visible storefront, training salespeople, and coddling customers. Spared this costly overhead, mail order outfits can routinely undercut retailers by 40 percent or more and still make a decent buck.

That no-frills approach to selling hardware and software can be attractive to a buyer, particularly one who has already decided which products to purchase and needs little help beyond the instruction manuals in learning to use them. Why pay $495 for WordPerfect when you can snap up a copy for less than $250?

Yet many people do opt for the retail route, paying the full suggested list price or close to it for their hardware and software. Why is that? Perhaps it's because the likes of ComputerLand and Entre can provide training, assistance, and service when you need it. With mail order purchases, you get the product itself and little else beyond that.

Whether you're buying for yourself or for the office at large, you should weigh the pros and cons of doing business by mail before you take the plunge. Mail order, despite the allure of discounts, is not for every environment or personality. Here are some of the factors to consider:

PRICE

■ Without question, buying hardware and software through the mail is cheaper—usually a lot cheaper—than buying the same items over-the-counter. We informally surveyed 16 mail order companies (anonymously so as not to get preferential prices or treatment) and found that most were selling their advertised goods for the advertised prices—or less. Discounts of 30 to 40 percent are common, and 50 to 60 percent markdowns are not unheard of, particularly with new software.

Our scouting mission began with a little comparative shopping. Prices can vary quite a bit from one vendor to the next, but all are low enough to make one's dialing finger itchy. You need only look at what we found with six products to get the general idea:

Product	**List**	**High**	**Low**
WordPerfect (IBM)	$495	$250	$195
PFS:Professional File	$250	$159	$112
Excel (Mac)	$395	$227	$209
Epson LQ-800 printer	$699	$631	$439
NEC MultiSync monitor	$899	$719	$549
Plus Hardcard 20	$899	$699	$609

As you can see, even the highest prices we found are tempting. And most of the prices we were quoted were closer to the low than the high. The appeal of low prices is strong with budget-minded individuals, of course, but it can prove just as alluring to corporate customers. Buying a dozen copies of WordPerfect through the mail might net you a savings of $3,000 or more, for instance. While some manufacturers and dealers offer volume discounts to corporate customers, mail order prices are still lower in most cases. A few mail order companies we surveyed said they, too, offer discounts on volume purchases—on top of the standard discount. Some firms advertise this fact; with many companies, however, you have to ask for specifics.

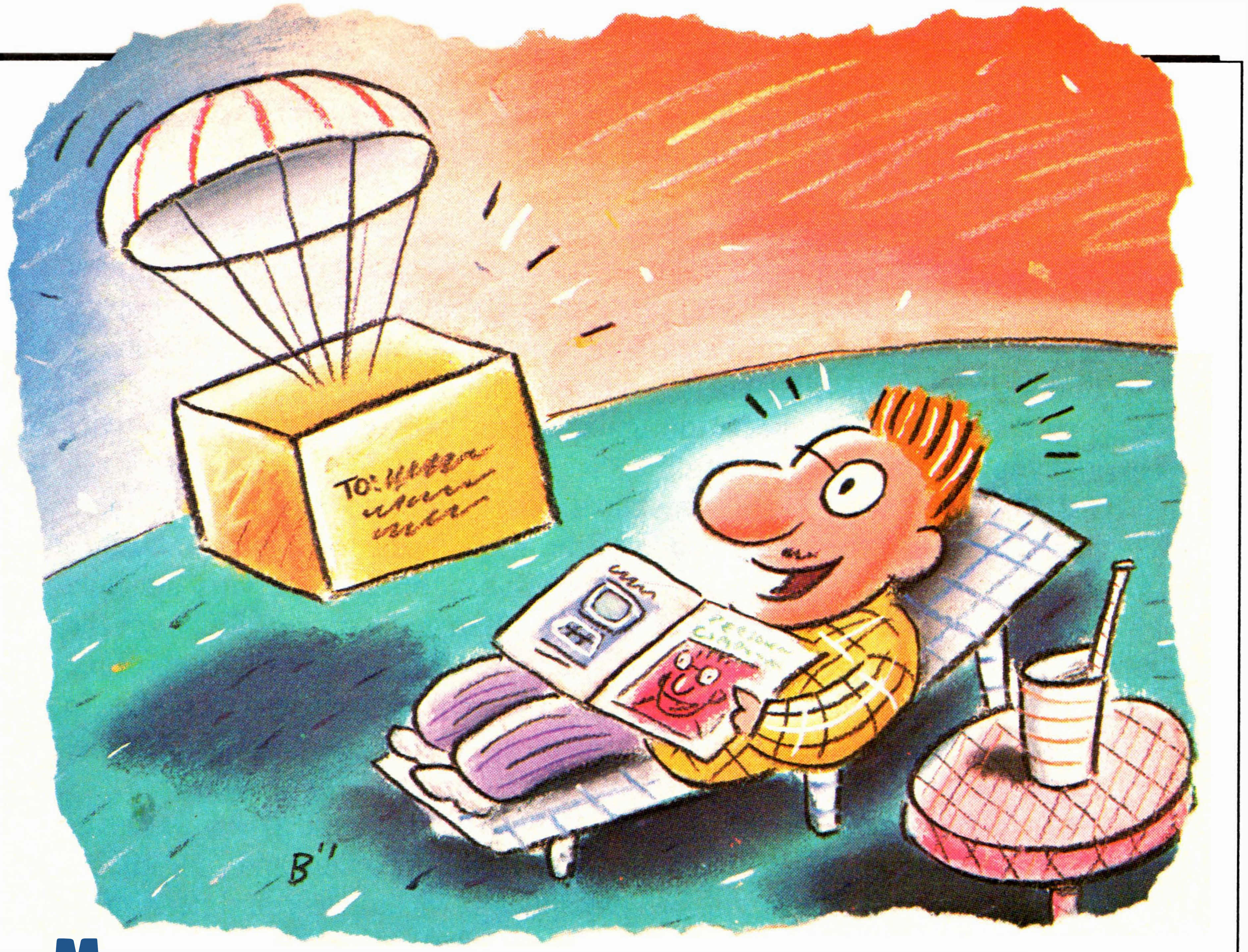
Do these prices represent the bottom line, the amount you will actually pay? More or less. You have to pay shipping costs, of course, which typically tack 2 to 5 percent onto your order. You may encounter small but deceptive surcharges as well; more on that later. But on the whole, the prices are real. In fact, many mail order firms say they will beat any competitor's price, even if they best a price only by a dollar.

Is all this price-cutting putting pressure on the retailers? You bet. Some now sell the bulk of their stock at 10 or even 20 percent off suggested retail prices; others offer discounts as needed to close a sale. But don't expect 40 or 50 percent off at the corner store. Mail order wins the price battle every time.

QUALITY

■ Most of the products you'll see in mail order ads are the same products you'll see in stores; every mail order company we contacted said the goods they sold were fresh from the factory—no seconds or reconditioned items—and our experience gives us no reason to doubt them. An Epson printer we ordered by mail, for example, arrived in a sealed factory carton with all of the proper parts and warranty information. And a copy of WordPerfect we received through the mail was shrink-wrapped and complete.

The issue of product quality does come into play with "house" brand merchandise, most of which is hardware. While some no-name products have garnered respectable reviews, it is unquestionably a chancy buy. Unconditional money-back guarantees make it less risky, as do lengthy warranties.



GARY BASEMAN

Mail order is the ultimate convenience. It saves time and steps, and you can comparison shop and charge orders from your home or office.

CONVENIENCE

■ Pick up the phone and charge it. What could be more convenient than that? True enough. Buying hardware and software through the mail, like buying sweaters from L.L. Bean, requires only that you reach for your wallet with one hand and your telephone with the other. It's a little like the Home Shopping Network, without the moving pictures.

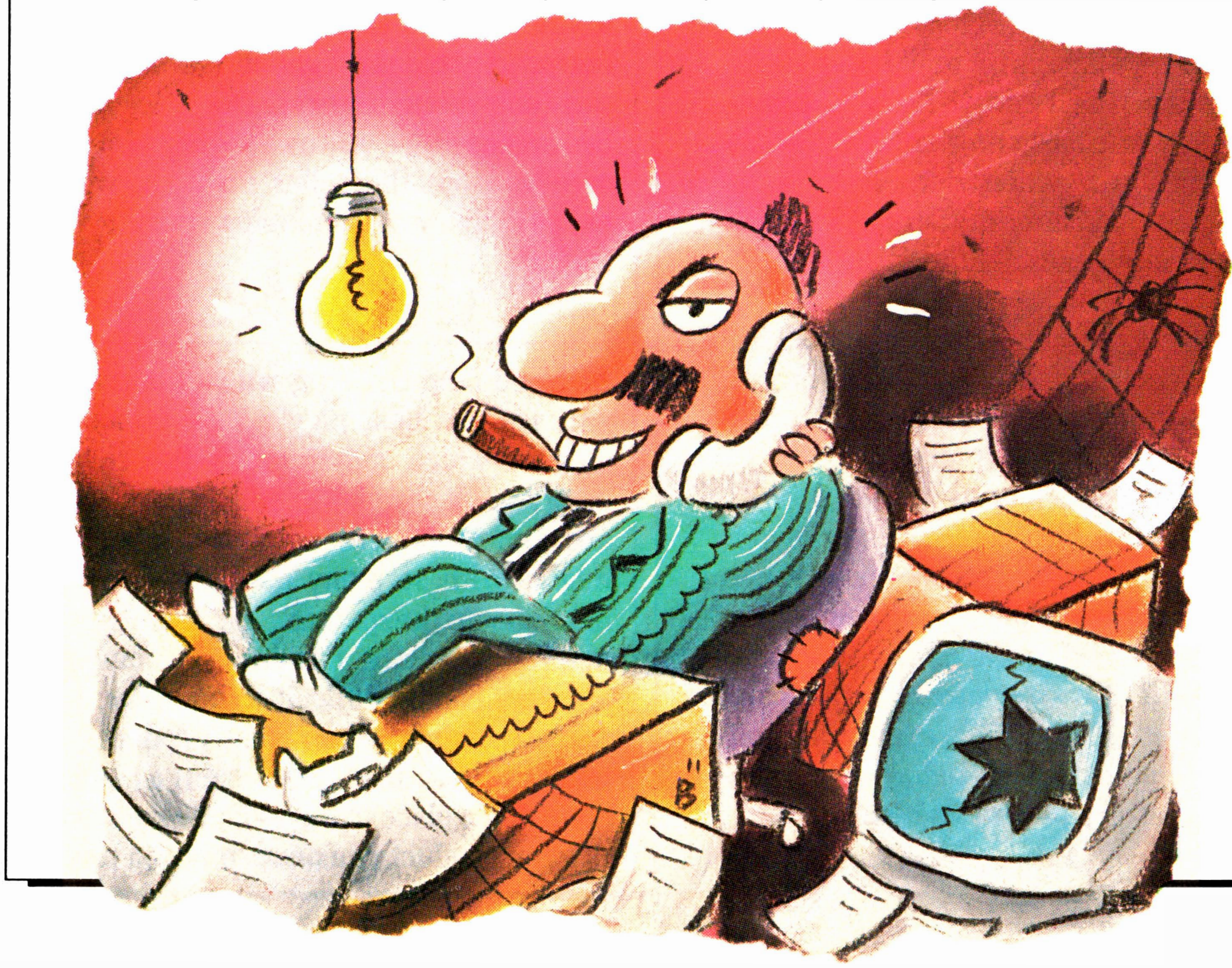
Armchair buying has a few obvious advantages: it saves effort, time, and gasoline. Big deal? No, not when ComputerLand is three miles away. But when it's 30 miles, or simply out of your way, a phone call can be an appealing alternative. Calling in your order gives you a more subtle edge, too: control. It is easier to keep eager salespeople at bay over the phone, it seems, than when you are confronted in person. After all, you can always say, "No thank you" and hang up the telephone.

It's also easier to shop around when you're ordering by phone. Nearly all mail order firms provide toll-free "800" numbers for ordering and getting a little information. Since it's their dime, you can feel free to call several companies to get the latest on prices and practices. Most of the salespeople we spoke with in our survey cheerfully gave us the pricing and shipping information we wanted, though a few grew curt when we insisted they clarify company policies. Don't be bullied—you have a right to know what you're getting into. Shop elsewhere if you think that the salespeople are uncooperative.

There is nothing convenient, however, about waiting several days for your order to arrive. Assuming the item you want is in stock, most mail order companies will send it out within 24 hours via UPS (ground or air, depending on where you live). It'll take three to six working days, in most cases, to arrive at your door. You have the option, of course, to have any item shipped overnight or second-day air, but you have to pay the premium for these services.

Sometimes mail order can be faster than a trip to the store. We searched in vain recently to find a nearby store that had a particular printer in stock. All of the stores we contacted said they could order the printer, but it would take two or three weeks to arrive, maybe more. A few phone calls and three days later, we got the printer—from one of several mail order firms that had the unit we wanted in stock.

While it happens rarely, mail fraud does occur. Guard against it by checking around before you buy, and complain if you do get cheated.



GARY BASEMAN

RISK

■ Can you trust these people with your Visa number or your check? In the majority of cases, yes. Most mail order companies appear to ship promptly and bill correctly. But that's not always so. Mail fraud can and does occur from time to time. An estimated 1 percent of all mail order dollars (for all kinds of products) are squandered, according to government statistics. And there are no statistics chronicling the frequency of delays and other problems.

A number of readers have written to us with complaints about merchandise or refunds they never received. One company about which we received numerous complaints, Northeastern Software of Shelton, Conn., is out of business—its phone lines have been disconnected and no forwarding address was left with the local post office or Chamber of Commerce. Northeastern Software, we learned from

Avenues Of Recourse

Most companies selling computer products by mail deliver what they promise when they promise it, eager to earn a good reputation and get your business the next time you go shopping. But a minority of mail order firms—less than 5 percent, according to most estimates—deliver shoddy products, deliver only after lengthy delays, or don't deliver at all.

Fortunately, you can take action against unscrupulous outfits. Here's what to do if you encounter a problem:

CALL THE COMPANY. Honest mistakes do happen, so you should try to straighten things out over the phone first. Explain the problem and inquire what will be done to fix matters. Ask the spokesperson to be very specific: When, exactly, will they ship the order and when will it arrive? What are the procedures for returning products? If you feel you're getting the runaround, ask to speak with someone in charge, like the mail order supervisor. Make a record of when you call and with whom you speak—it guarantees you no legal rights, but it can help you substantiate your efforts later if necessary.

SEND A LETTER. Should your phone call prove fruitless, send a certified letter (with return receipt) to the company, detailing your problem and your efforts thus far to resolve it. Here, too, be very specific. Include in your letter information on what you ordered, when you ordered it, from whom you ordered it (if known), what it cost, how you paid, when it was supposed to have arrived, and so on. Tell the company you expect immediate action on their part or you will take further steps.

DISPUTE THE MATTER. If you don't hear from the company within a week or so, it's time to take action. The Fair Credit Billing Act gives you the right to dispute any charge on your credit card bill that you believe is in error or reflects a transaction with which you have a problem. In so doing, you are requesting a "chargeback"—asking that the credit card company charge the goods back to the merchant. You must make this request in a letter to the card issuer, independently of your bill payment, explaining the circumstances of the transaction and your efforts to resolve matters. You can dispute a claim before or after you pay the bill, and legitimate chargebacks are often approved.

If you send a check or money order through the mail, you can contact your local Postal Inspector to handle the dispute (ask a Post Office employee to refer you or check the White Pages of your phone directory). The Postal Service can't resolve all disputes, but it has regulations on mail order transactions and has a reputation of enforcing them. The Federal Trade Commission (FTC) also has mail order regulations, particularly on a company's failure to ship purchased goods. But the FTC, in practice, does little or no case-by-case enforcing. Still, county and state consumer affairs offices can take up this mandate, as can the state attorney general's office and the regional office of the FBI.

There's one other avenue you might want to pursue: write to the Mail Order Action Line at the Direct Marketing Association, Inc., 6 E. 43rd Street, New York, NY 10017. This trade group does not guarantee success, but it does contact the company in question in an attempt to settle the dispute.

FOLLOW UP. In business transactions, bad publicity is the best revenge. Report your troubles, resolved or not, to the Better Business Bureau in your area and at the company's location so a record of your complaint is on file to warn others. Send a copy of your complaint to consumer affairs agencies, particularly those in the company's home state, and to the FTC in Washington. Write to the publication where you saw an advertisement for this company, relating your experience; a newspaper or magazine cannot be held responsible, of course, but it may intercede on the reader's behalf or reevaluate its acceptance of ad material based on a pattern of serious complaints.

—C.O.

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the state Consumer Protection Agency, has in fact filed for bankruptcy. Customers owed money can file a claim as a creditor by writing to the U.S. Bankruptcy Court in Connecticut at 915 Lafayette Blvd., Bridgeport, CT 06600.

Jilted customers, in cases where the company ceases operation and seemingly disappears, may have to dig a little to discover any recourse.

Outright fraud represents only one risk. Delays and improper billing are common complaints as well. Several of our readers singled out a company called PC Network for failing to deliver products as promised, yet charging customer credit cards in the meantime. Natalie Lofton, customer service supervisor at PC Network, says normal delivery time is two to three weeks and that it is "company policy to pre-bill" customers—that is, charge their credit cards when the customer orders, not upon delivery. In contrast, many other companies we surveyed say normal delivery is one to two days and the company will make no charges until it ships the merchandise. As for delivery times running beyond two or three weeks, Lofton cites recent inventory problems ("Sometimes these things are beyond our control") and says the firm is "trying to rectify [the situation]."

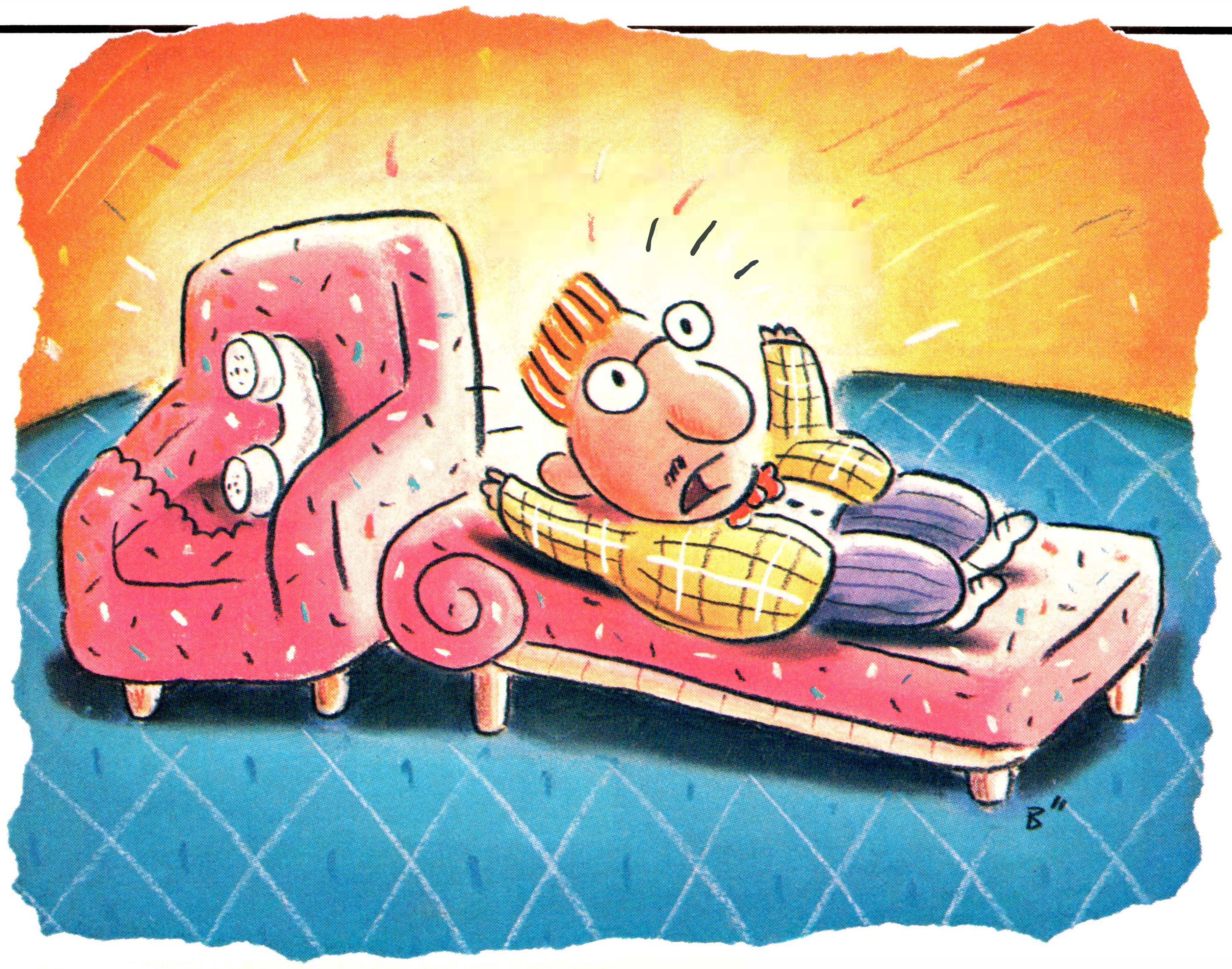
Companies that leave a trail of unhappy customers aren't in business very long. You can check old issues of magazines to see who's been around for a while or, better yet, ask friends and colleagues with mail order experience for their recommendations. Check, too, with the Better Business Bureau in the city where the mail order company is located to see if others have registered complaints; if so, look for another mail order source.

Of course, you do have legal recourse if you feel you've been cheated, but it's better to avoid the fight altogether if you can (see related story). Don't let a few bad apples scare you away—just be more careful about the seller than you would be, perhaps, when shopping retail.

GARY BASEMAN

GUIDANCE

■ Need help deciding which accounting package can best juggle your books, or judging which monitor has the richest color, or determining which hard disks are compatible with your computer? You might. With so many products and connections to keep track of, it's easy to need some advice. But straight, complete answers can be difficult to come by, particularly when you order products by mail. In short, mail order is not a place to shop, but a place to buy—if you're unsure of what product you need or how a partic-



GARY BASEMAN

Judging products sight unseen can present problems for the uninitiated, so ask questions of mail order operators and savvy colleagues.

ular product performs, mail order probably isn't for you.

While some of the mail order salespeople we talked with were knowledgeable about the products they were selling, many seemed to know little more than the procedures for taking your money. Some of these people admitted as much, and referred us to others in the "technical service" area, only some of whom were helpful. A few salespeople, however, tried to fake their way through or were simply as vague as possible.

The counsel of salespeople in retail stores can be hit-or-miss as well, but typically they are better trained to dispense advice. In a store, you have the added advantage of seeing and trying before you buy—a big plus. Of course, you can poke around the store, ask a few questions, and then order by mail. Unfair to the store owner? Perhaps. But once you are inside, he at least has a shot at winning you over. Certainly, there is nothing wrong with seeking the advice of friends and colleagues before ordering by mail.

SUPPORT

■ Once the purchase is made, then what? With orders placed by phone and received by mail, you're largely on your own. Support services like training seminars and technical assistance may come under the price umbrella of retailers, but mail order companies—who don't have as much of your money to play with—can't follow through as completely.

Naturally, you can't expect to get any hands-on training from mail order sellers. That shouldn't be a problem with peripherals such as printers or monitors, which require little or no training to use. But it may prove troublesome with sophisticated software and entire computer systems. You can go it alone with the help of whatever tutorial material is included or seek—at extra cost—the help of consultants or seminars.

Many mail order outfits do have a toll-free technical support "hot line" that you can call with questions and problems; in fact, three out of four companies in our survey had one. But many of the support people we spoke with did little more than refer us back to the instruction manual or to the company that makes the product. Sometimes, that's fair enough. Instruction manuals, when read, can solve many problems, and some manufacturers, especially software publishers, offer hot lines of their own. But that kind of bouncing around can be frustrating when you need answers.

When you order computer products through the mail, you also forfeit a less tangible—but potentially important—support feature: face-to-face contact with someone who can help. It is almost always easier to get answers and iron out problems when you can sit down with a person instead of pleading with a distant voice. It also helps build a working relationship for the future.

SERVICE

■ What if it breaks? Or it's defective? If you bought it from a store, you can return it. With some service plans, a technician might come to you. But repairing or replacing mail order products is not quite so routine.

The odds that you'll need to return a product, while low, go up automatically when you buy by mail. Hardware and software can be damaged during shipping, a problem that retail stores normally correct before the product gets to you. Sending back the items that went bump in the dark of UPS trucks will cost you time, and perhaps money. Not only must you notify the company and await a new shipment, some mail order companies insist you bear the cost of returning the damaged merchandise. As you are beginning to sense, no doubt, you'll have to bear some aggravation, too.

Because the name-brand hardware and software products you buy through the mail carry the same warranty as those purchased in a retail outlet, you do have other options. With hardware, you can take defective products to a service center authorized to perform warranty repairs. But outside of major metropolitan areas, that can be a long haul. With software, you might deal directly with the publisher, which may or may not prove to be a faster route to resolving problems.

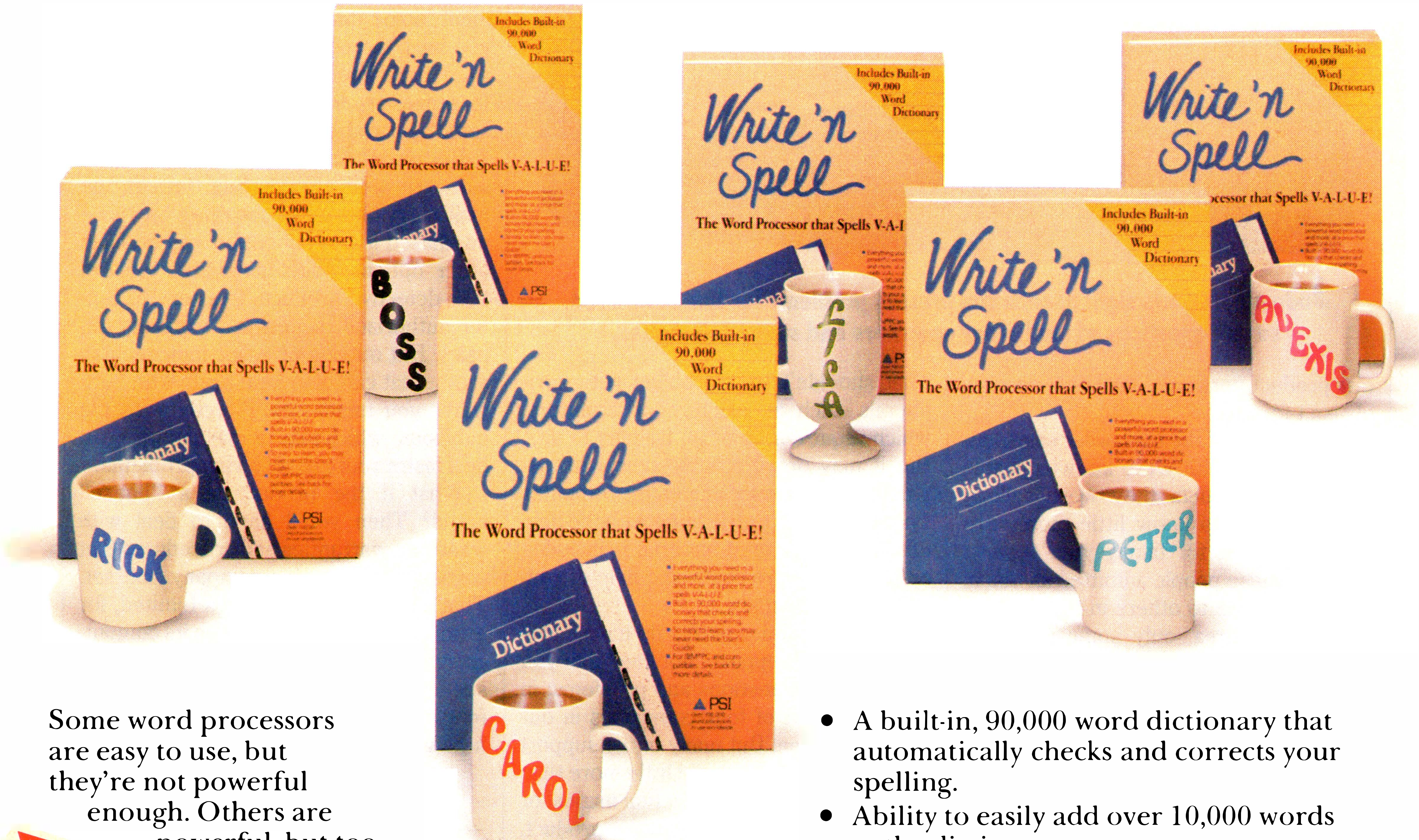
What if the product is a "house" brand? Then you'll have to deal with whatever warranties and procedures that particular mail order company has set. That's not always bad: PC's Limited, for example, offers a warranty on its computer systems for one year and free on-site service during that period. Logicsoft offers a five-year warranty on its line of hardware products.

READY TO ORDER?

■ If you're reasonably comfortable with the mail order mix of discounts and delays, convenience and inconvenience, reward and risk—and many people are—give it a whirl. But before you pick up the phone, break out the magnifying glass and eyeball some of the fine print at the bottom of the ad. As usual, there are important "details" discussed down there. Here are some of the topics you'll find mentioned in these statements of policy, with explanations and cautions you probably won't find:

SHIPPING Some companies charge a flat fee (i.e., $5 for each software shipment), others a percentage of your total order, and still others the actual expense as determined by the courier, which is usually figured by weight. Your order will go out UPS Ground in most cases, which normally means it'll be three to six working days before you receive the goods. Overnight and second-day service are almost

THESE WRITERS HAVE MADE A NAME FOR THEMSELVES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The Word Processor that Spells V-A-L-U-E!
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RICK
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- Ability to easily add over 10,000 words to the dictionary.
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- Ability to print graphs and text simultaneously (with certain printers).
- Supports over 70 popular printers.
- On-screen Bold and Underscore during typing.
- Horizontal Scrolling for wide documents such as spreadsheets.
- Many other features, too numerous to list. Professional Software, Inc. has been publishing quality software for seven years and has 250,000 copies in use worldwide.

For further information, or the name of your nearest dealer, call: ***1-800-343-4074.***

PSI

Professional Software, Inc.
51 Fremont Street
Needham, MA 02194
(617) 444-5224

Required Hardware: IBM-PC/AT/XT/JR or compatible computer system – Minimum 256K – Dos 2.0 or later.
Write 'n Spell is a trademark of Professional Software, Inc. IBM is a registered trademark of International Business Machines, Inc.

(For More Information Circle 115)

always available (only one of the outfits in our survey failed to offer these delivery services).

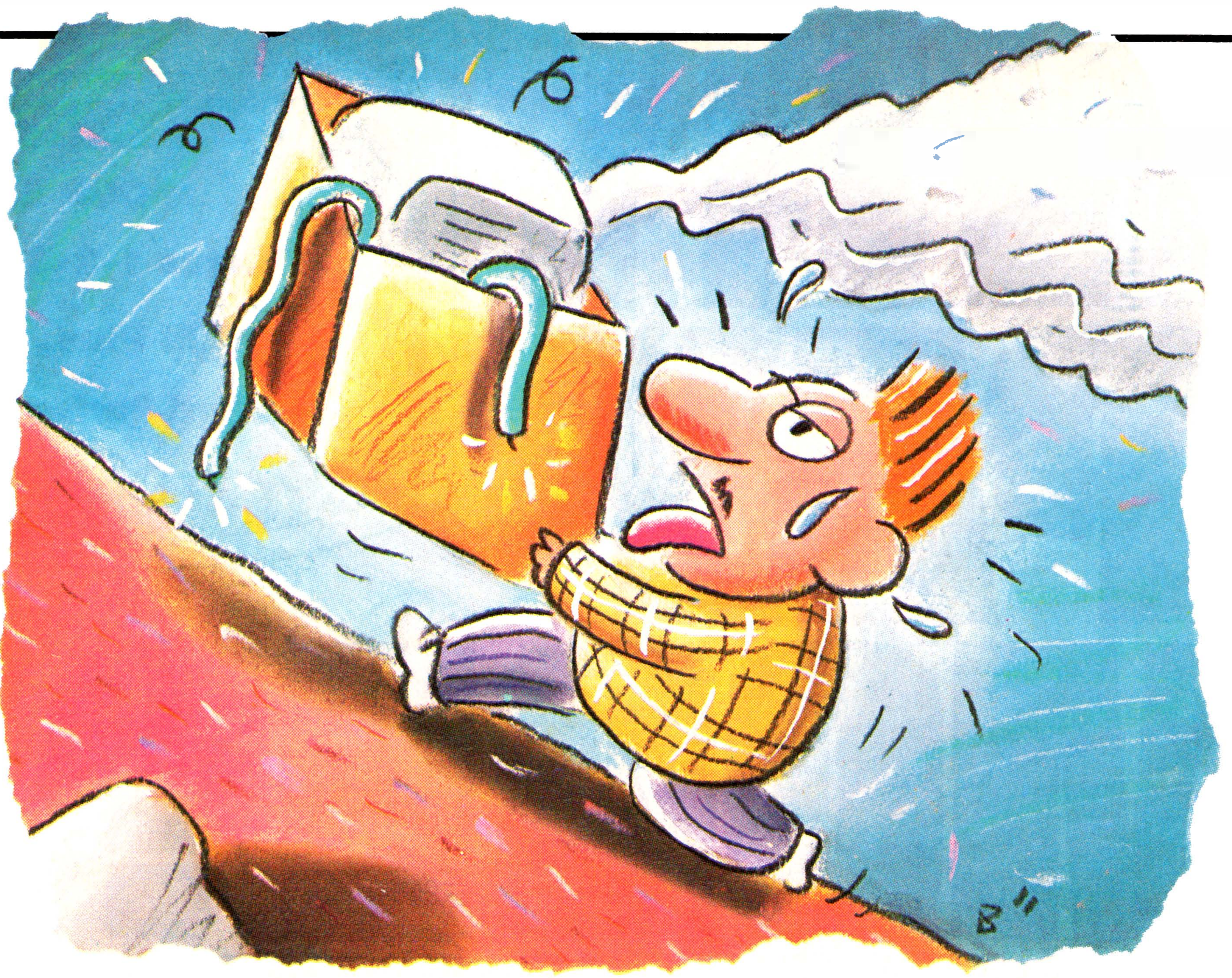
In theory, shipping the same item to the same place with the same priority should incur roughly the same cost. In practice, discrepancies of $10 or more on a single item are not uncommon. Be aware, too, that a few companies charge extra for "insurance and handling," costs that most companies include in the shipping quotes. Some mail order houses toss in shipping, even overnight shipping, for free, as bait, so check around for the best deal. Just be sure you're not paying $20 more for the product itself simply to save $15 in shipping costs.

PROCESSING It's logical, but not always correct, to assume that your order will be processed and sent out soon after you hang up the phone. Some companies do promise to get your order out the door the same day if you call before 3 p.m. or so. Others promise only to fill the order within 24 hours or 48 hours. All of this is contingent on the product being in stock; if it's not, you may want to shop elsewhere, because the wait is usually two weeks or more. Prompt fulfillment is also contingent on your using a credit card to pay for the order.

Nearly all mail order companies accept company or personal checks, but before your order is shipped, it will usually be held for a week or more until the check clears. Many companies also accept corporate purchase orders, though some limit this privilege to "Fortune 500" companies and/or require approval in advance. A few even allow corporate customers to set up charge accounts to expedite order processing. The phrase that pays with big customers seems to be "ask and you shall receive." Several companies we spoke with indicated that payment procedures are flexible—at least for regular customers with large orders.

One other processing caveat: If you pay by credit card, insist that the company not bill your account until it ships the order. If they refuse, shop elsewhere. It's merely a matter of principle in many cases, but it can cost you if the product doesn't arrive as soon as expected.

SURCHARGES A few companies ask you to pay for the convenience of using your credit card, charging you 3 percent or more of your total order for this privilege. Seven of the companies we contacted had such a surcharge, though five of these applied it only to orders placed with an American Express card (which costs them more to accept). Surcharges are a bit underhanded to begin with, and putting it in small print makes them downright deceptive. Avoid them.



GARY BASEMAN

Returning or servicing mail order products can be inconvenient and time-consuming, but manufacturer warranties offer alternative solutions.

There can be other surcharges, too. We found this one twice: "Prices reflect 3 percent discount for cash." Cash? One company used this phrase to mean "3 percent more for anything but a cashier's check or money order," while the other explained that it meant "3 percent more for credit cards." Again, avoid them.

TAX If the company from which you order a product happens to be located in the same state as you or your business, expect to pay sales tax on your purchase. Shipments that cross state lines, however, do not incur sales tax. Model citizens may want to report these purchases at the end of the year and pay up if state law invites you to do so.

RESTOCKING The ubiquitous "restocking" fee is a vague catchall warning you that it's costly to be an unhappy customer. What it means is this: If you choose to return a working product simply because you're not satisfied with it, you'll be refunded your purchase price minus a 10 to 20 percent fee for restocking. In other words, you'll get 80 to 90 percent of your money back, but not all of it. (That's if you can get them to agree to take it back at all; only a few companies told us they accept returns for refunds.) Is this fair? In some cases it is, because the company does have to return opened packages to the factory. But why some companies charge a 10 percent restocking fee and others charge a 15 or 20 percent fee is unclear. The bottom line: Be absolutely sure that what you order is exactly what you want.

COMPATIBILITY The disclaimer "We do not guarantee compatibility" is usually in the fine print somewhere, but even when it wasn't, that's the reply we got when we asked. A handful did claim to guarantee software compatibility with genuine IBM machines—but nobody was ready to vouch for the compatibles, not even for a trusted name like Compaq. Macintosh owners can rest easier, as there are no Mac clones to cloud the issue. When pressed on the matter, some companies said they would probably permit customers to return an incompatible product for a refund minus, of course, any restocking fee they charged.

MISCELLANY You may encounter other disclaimers and caveats in your perusal of mail order ads. Don't let them slide by your eye unless you know what they mean—they can come back to haunt you. Call first, and insist on a clear explanation. And, as with any advertisement, keep an eye out for asterisks. These little devils invariably mean there's more to the deal than they're telling you in the headlines.

Still a little apprehensive about buying by mail, but want to give it a try nonetheless? Make a few calls without committing to anything, just to get the feel of the process. Then, if possible, start small. Order an inexpensive program or peripheral and get a little firsthand experience. When and if you're ready to do so, move up to pricier items.

Mail order isn't for everyone. But if you know what you want and are familiar with hardware and software, or if you're facile at divining meaning from instruction manuals, buying by mail can make computing a lot more affordable. ■

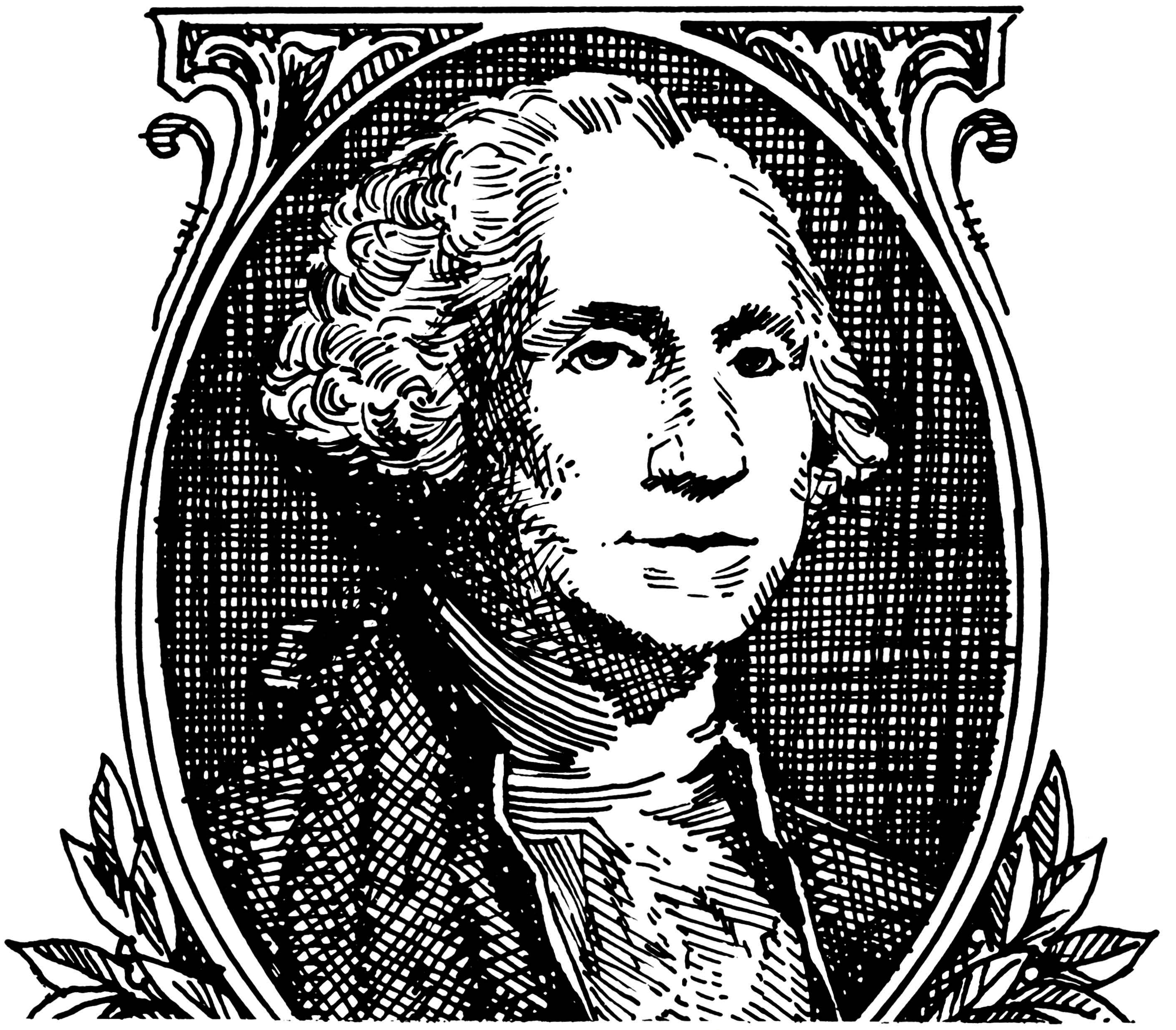
WHY PAY MORE?

FEDERAL RESERVE NOTE

OUR EVERYDAY LOW PRICES

Lotus 1-2-3	$305
DB III Plus	$389
Word Perfect	$195
PC Mouse w/Dr. Halo	$99
NEC Multisync	$549

ONE DOLLAR



YOUR MONEYSWORTH GUARANTEE

- ★ Credit cards not charged until after your order has been shipped
- ★ Orders shipped same day on all stocked products (on orders placed by 2pm EST)
- ★ All products guaranteed to be the latest versions available
- ★ Only factory sealed and fully warranteed products stocked
- ★ Never a surcharge for American Express, Visa or Mastercard

• No sales tax on orders shipped outside NY State • Please add 3% for insurance, shipping and handling ($3.00 minimum) (Some products may have a surcharge due to weight and size restrictions) • Defective merchandise can be returned for repair or exchange (please call for R.A. no.) • Due to variety of products, we cannot guarantee compatibility

(For More Information Circle 103)

GRAPHICS/CAD-CAM

Autocad 2.56	$2,229
Drafix	209
Freelance Plus	299
Harvard Presentation	219
Microsoft Chart	165
Prodesign II	169

LANGUAGES

Microsoft C	$249
Microsoft Cobol	385
Microsoft Fortran	249
Microsoft Macro Assembler	84
Microsoft Quick Basic	55
Turbo Pascal	55

PROJECT MANAGEMENT

Harvard Total	$345
Microsoft Project	219
Super Project Plus	269
Time Line	225

FINANCIAL/ACCOUNTING

BPI	$145
Computer Associates	325
Dollars 'N' Sense	95
Great Plains	389
Managing Your Money	105

UTILITIES

Carbon Copy	$119
Crosstalk XVI	88
Disk Optimizer	31
Fast Back	84
Fixed Disk Organizer	45
Microsoft Windows	55
Norton Commander	36
Norton Utilities	48
Norton Util. Adv. Ed	79
PC DOS 3.2	75
PC DOS 3.3 (IBM PS/2)	99
Sidekick	47
Sideways	39
Smart Com II	74
Superkey	39

SPREADSHEET/INTEGRATED

Enable	$329
Framework 2	395
HAL	89
Lotus 1-2-3	305
Lotus Metro	55
Lotus Report Writer	75
Microsoft Multiplan	105
Smart Integrated	399
Supercalc IV	269
Symphony	439

WE CARRY ALL AVAILABLE 3½″ FORMATS.

DATABASE MGMT

Clipper	$335
dBase III Plus	389
Foxbase +	229
Genifer	185
PFS Professional File	135
R:Base System V	345
Reflex	81

WORD PROCESSING

Display Write IV	$309
Easy Extra	79
Lotus Manuscript	329
Microsoft Word 3	247
Multimate	219
Multimate Advantage	259
PFS Professional Write	109
Ventura Publisher	549
Volkswriter	135
Word Perfect	195
Wordstar 2000 Plus	195
Wordstar Professional (Ver. 4)	229
XY Write III	199

LAPTOPS

Toshiba T1100 Plus	$1,549
Zenith Z181	1,749

SURGE PROTECTORS

KENSINGTON MICROWARE	
Masterpiece Plus	$109

BACK UP POWER SUPPLIES

DATASHIELD	
300 WT (XT)	$335
500 WT (AT)	525
800 WT (AT)	545

MODEMS

HAYES	
Smartmodem 1200	$345
Smartmodem 1200B	315
Smartmodem 2400	539
Smartmodem 2400B	469
MIGENT	
Pocket Modem	189
MONEYSWORTH (Hayes Comp.)	
Money Modem 1200 (Ext)	139
Money Modem 1200B (Int)	115
Money Modem 2400 (Ext)	249
Money Modem 2400B (Int)	289

GRAPHICS

HERCULES	
Graphic Card Plus	$185
Color Card	145
NEC	
GB 1 (EGA)	339
PARADISE	
Auto Switch EGA	305
QUADRAM	
EGA Plus	279
Pro Sync	325
VIDEO 7	
VEGA	275
VEGA Deluxe	335

MULTI-FUNCTION BOARDS

AST	
Six Pack + 384K	$189
Six Pack Premium	199
Advantage 128K	329
Rampage AT W/512K	405
Rampage W/256	249
MONEYSWORTH (AST Comp.)	
Money Memory ½ Card (384K)	119
Money Memory ½ Card (576K)	145
Money-Board AT Multifunction (128K)	199
Money-Board Multifunction (384K)	155
Money I/O Mini-Half Card	99

MONITORS

AMDEK	
12″ 310A	$139
410 A	165
Color 600	369
Color 722	459
NEC	
Multi-Sync	549
PRINCETON	
Amber Max-12	149
RGB HX-12	399
RGB HX-12E	479

PRINTERS

DICONIX	
Diconix 150	$305
EPSON	
FX 86 E	325
FX 286 E	455
EX 800	389
EX 1000	519
LQ 800	455
LQ 1000	659
LQ 2500	909
HEWLETT-PACKARD	
Series II	1,829
NEC	
P-660	429
P-760	609
OKIDATA	
182 Plug & Play	229
192 Plus	345
193 Plus	525
TOSHIBA	
351 P/S	939
321 P/S	449

MOUSE INPUT DEVICES

MICROSOFT	
Mouse (Serial)	$119
Mouse (Buss.)	105
MOUSE SYSTEMS	
PC Mouse	99

HARD DISKS

PLUS	
Hard Card 20 Mb	$599

BACK UP STORAGE DEVICES

EVEREX	
Excel 60 Mb Int	$719
Excel 60 Mb Ext	845
IOMEGA	
Bernoulli (10 + 10)	1,349
Bernoulli (20 + 20)	1,759
Bernoulli 10 MG Cartridge Tri-Pak	145
Bernoulli 20 MG Cartridge Tri-Pak	245

All prices and policies subject to change without notice.

FEDERAL RESERVE NOTE

"The True Measure of Value"

MONEYSWORTH®

COMPUTER PRODUCTS, INC., 366 North Broadway, Suite 310, Jericho, New York 11753

FOR ORDERS ONLY **1-800-237-9161** Customer Service (516) 249-8489

ONE DOLLAR

1607

HARD DISKS

WHEN BIGGER IS BETTER

As prices decrease and reliability increases, businesses just can't say no to high-capacity hard disks. Data-hungry PC applications now require as much storage space as mainframes once did.

by Denise Caruso

Given the combination of increasingly sophisticated needs and constantly dropping prices, there is a certain inevitability to the use of ever-higher and higher capacity hard disk drives by businesspeople. The newest models—60 megabytes and up—are turning out to be magnetic in more ways than just their medium.

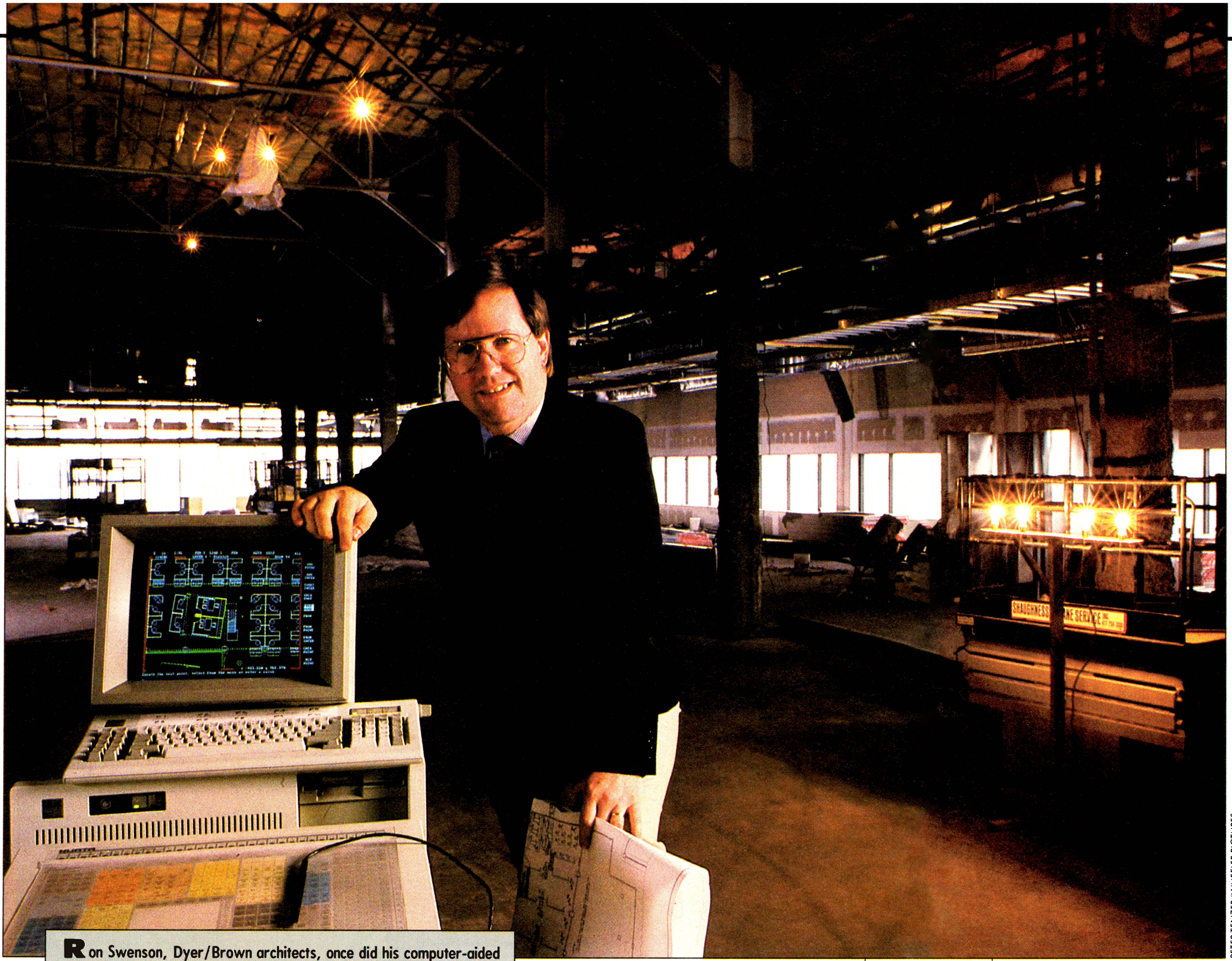
If you work alone, you may be running out of space and feeling hampered by a 5- or 10Mb hard disk. If your business is growing, you may need to share files over a local area network. If you have big program files, big data files, or thousands of small files in a data base, a high-capacity drive can make work a less stressful experience.

And even if you're seduced into buying more technology just because it's there, an impulse buy isn't nearly the risk or the expense it used to be. Only five years ago, 5Mb hard disks—slow and unreliable by today's standards—were

Denise Caruso, a San Francisco-based freelancer, wrote about how to buy software in February.

Kelly Lucas, Kern River Cogeneration Company, uses a Macintosh to analyze operations. It's connected via AppleTalk to a 170Mb hard disk that also links to the company mainframe.

STEVE SMITH/WHEELER PICTURES



PETER TENZER/WHEELER PICTURES

Ron Swenson, Dyer/Brown architects, once did his computer-aided design on a minicomputer. Now he can do the work on one of the firm's PC ATs, stuffed with two 60Mb hard disk drives.

selling for a whopping $2,000. Today, you can buy hard disks with 20 times the storage space for just twice that price.

Bigger isn't necessarily better, however, and a critical view of the field of products is always the safest bet before buying. Users shouldn't have to sacrifice features like access time, reliability, and product life expectancy.

A hard disk's average access time should be no slower than 40ms (milliseconds). A faster drive will definitely be more expensive than one that accesses at a pokey 80ms. But there is little use in having thousands more electronic pages of data on any disk if you have to sit around drumming your fingers waiting for it to appear.

The software that's shipped with the drive is important, too. Some drive companies ship software that overcomes the DOS limit for a maximum partition size of 32Mb for IBM PCs and compatibles. This is especially important if you don't need a single massive data base. Other companies ship their own brand of disk backup software, of vital importance in the higher capacity drives.

Also remember that in regard to reliability, you are likely to get what you pay for. Thus, price should not be the determining factor in purchasing a hard disk. Two factors to note carefully are the drive's warranty and its "mean time before failure (MTBF)."

A 90-day warranty for a piece of equipment you'd like to use for several years isn't really sufficient; look for a longer one. And although no one can really predict how long a drive will last, the manufacturer's specification for "mean time before failure" can clue you about the drive's life span. Right now, the standard is about 20,000 hours. Anything less than 18,000 should be viewed with suspicion—since, for example, a drive with a span of 12,000 is only estimated to last about 1.3 years.

Anyone who bought one of those clunky hard drives way back when will be amazed by the transformation of the medium since then. Pushed by economies of scale, hard-drive manufacturers adopted standards to improve both speed and reliability. Better manufacturing processes helped them to put additional millions of bytes on the same size platter. That accomplished, all they needed were those frustrated users who had already filled up their hard disks and wanted room for their ever-growing store of data.

They weren't hard to find. Jim Moore, a market analyst for Dataquest, Inc., in San Jose, says that the market for 31- to 100Mb hard disks grew 149 percent from 1985 to 1986 while in that same period the market for disks of 101Mbs and up grew by 250 percent.

These high-capacity disk drives are going to places like the Kern River Cogeneration Co. (KRCC) of Bakersfield, Calif., which produces electricity and steam. The company uses a Macintosh network to help analyze its operations. The AppleTalk network, with a 170Mb hard disk, produces reports that are based on information collected by a mainframe. This information is keypunched into the Macintosh network from hard copy.

Kelly Lucas, an administrative supervisor for KRCC, says the company decided to get a high-density disk and form a Mac network in June 1985. "We didn't have any mass storage before then; we really jumped in feet first," he explains. "We were in the process of building a second plant so we assessed our needs and decided to go with the LAN." The company traded in its Apple Lisa computers over a period of time, gradually upgrading to 19 Macintoshes.

Bruce Wallace, executive director of the Administrative Resources Association (ARA) of Columbus, Ind., made a similar decision. A consulting firm, ARA provides technical assistance to a group of 12 cities and towns seeking federal grants for community and industrial development. His office uses a 70Mb hard disk in addition to a file server to connect five Macintoshes, a laser printer, and a regular printer hooked to an image digitizer.

ARA's employees pass along correspondence and contract drafts on the network, and take turns using software for desktop publishing and word processing as well as for the laser printer. Electronic mail provides for communication and the transfer of files across volumes. "The only work not done on the Mac is a federal application form that we can't reproduce," says Wallace. "We draft contracts, loans, loan agreements, and all kinds of information for city attorneys." Personalized brochures, special reports, and bulletins for each member city are also created on the network.

Other business users find high-capacity hard disks are necessary when their applications take up a lot of space or generate large data files. In the past, many such applications were only feasible on mainframe or minicomputers. With the advent of fast processors, cheap memory, and cheaper storage, many of these applications are becoming available for personal computers, giving users greater control and greater flexibility.

Dyer/Brown Architects in Boston has made good use of the change. Ron Swenson, an associate with the firm, says they used a Hewlett-Packard 9000 minicomputer first for computer aided design (CAD). Then, about a year and a half ago, the firm's favorite CAD software was simultaneously upgraded and ported to the MS-DOS environment. But today, Dyer/Brown does most of its CAD on three IBM PC ATs, each one stuffed with two 60Mb hard drives and 3.5Mb of memory.

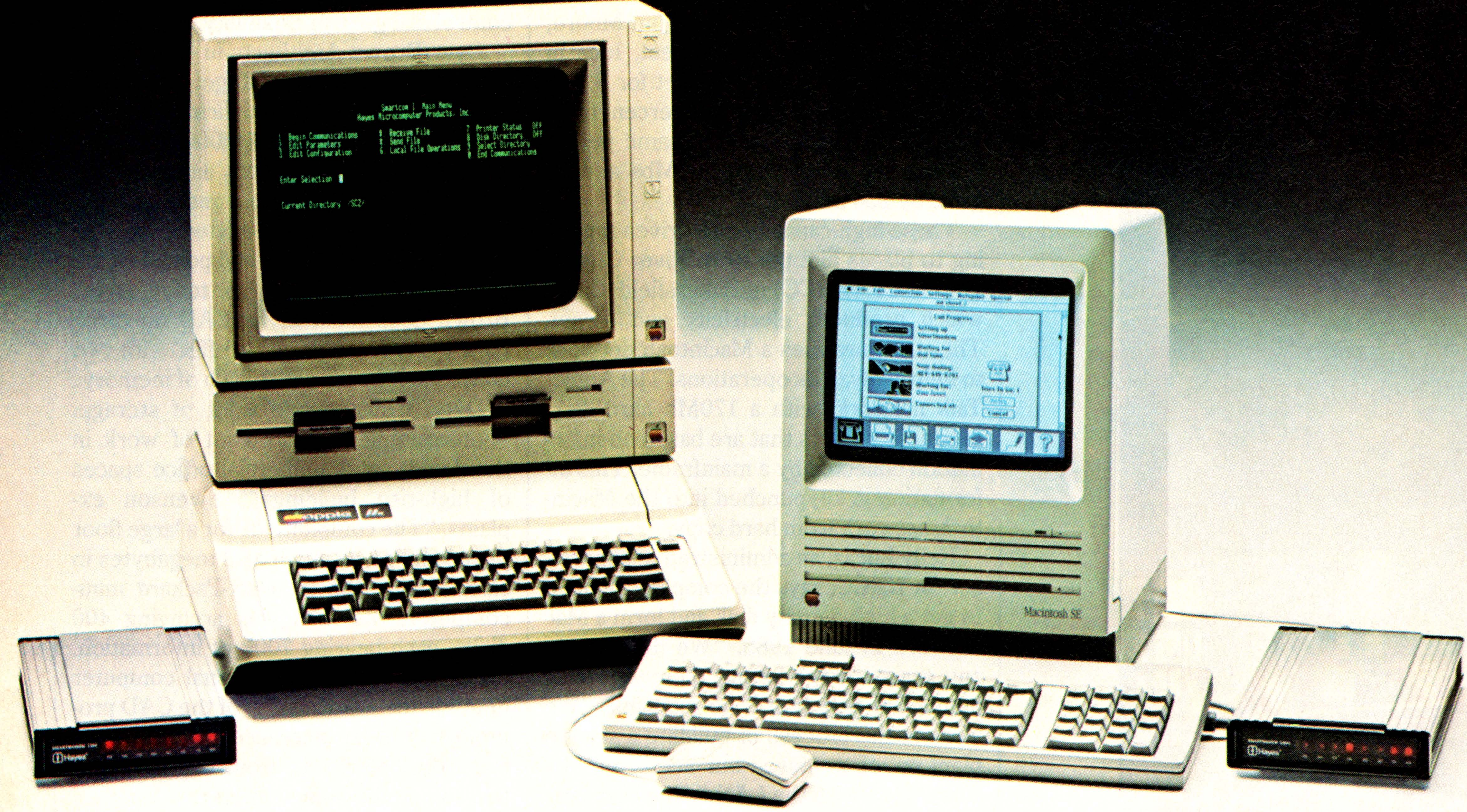
Dyer/Brown needs a lot of storage. "For example, we do a lot of work in the downtown commercial office spaces of high-rise buildings," Swenson explains. "The complete file for a large floor plan could be as much as 3 megabytes in size." Using the Hewlett-Packard minicomputer, the firm was archiving 400 disks, each bearing 700k of information, each year. With the personal computer upgrade the drawing size of the CAD program has been increased to 256 layers (virtually unlimited), from the 16 layers that ran on the minicomputer.

Sheer file size is often the determining factor for a switch to high-capacity hard disks. Bruce Simonton's employer, Imperial Irrigation in El Centro, California, is a county-wide water-and-power company, serving 200,000 electrical customers. It invested in high-capacity hard disks to run huge applications programs that generate vast amounts of data.

One project uses personal computers to analyze data generated from the flow of water under a gate, and Simonton says it requires 120Mb just to get the data and the series of programs to analyze it in one place. He's set up two PC ATs so each has an 80Mb and a 40Mb drive sharing a controller.

"It takes 12 hours to generate the graphs of one day's readings from our remote sensors," says Simonton. "We run hydraulics programs along with Symphony, and the programs need to be interactive so we don't have to have an operator stay there and load each of the programs all night. We set it up so the programs are interactive through an AUTOEXEC.BAT file, and they generate a whole stream of graphs."

When the system was first established, says Simonton, an employee who didn't know what was going on came in at 4 a.m., thought the computer had been left on by mistake, and turned it off. "An inch-high stack of graphs had already come out of it," he notes.



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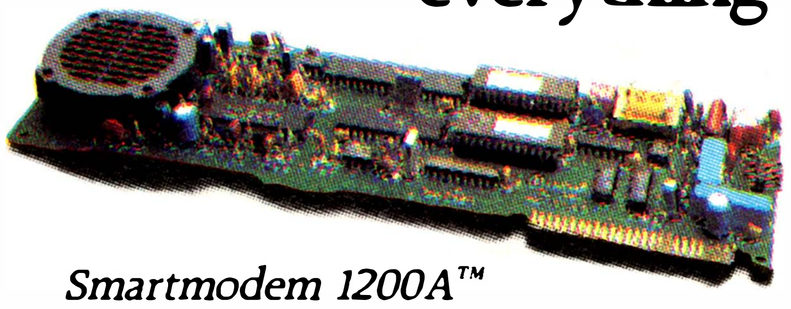

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(For More Information Circle 60)

"Operator error" is only one problem. Another (usually the first encountered) derives from the fact that IBM's PC family and compatibles can only access 32Mb of data at once. Luckily, many drive companies include modified disk-driver programs and a patch program for MS-DOS so it can run with larger disk sectors. (This is definitely something to ask about if you don't want to split your 100Mb-plus drive into three or four logical drives.)

Companies do experience other problems as well. "The biggest one we've had was that the earliest Finder software made by Apple could only handle 60 or 80 files," says Wallace of ARA. "If you went over, you'd have system crashes. That did happen several times before we realized what was going on. I kept thinking we'd never have 80 files. Later we figured out we should set up more volumes so there would be less files per volume. Now we have almost unlimited capacity, and zero problems."

Still, a hard disk-based LAN isn't necessarily the most flexible system created. With most hard drives, disk portions that are set aside for individual data storage must be fixed. Lucas at KRCC bemoans the extra work for the system administrator. "I have to set everybody at a static number right now," he says. "If someone working on a big project needs more than he's been allocated, I have to borrow space from someone who doesn't need that much. If I had a dynamic system, the person who needed more space would [automatically] have it. As he added to his file, his volume would keep going. As he cleaned out his volume, the total volume would decrease and there would be more room on the disk for everyone else."

And, of course, the penalty for not doing a backup on a disk which can hold, say 41,000 pages of data, and crashes, is substantial.

Drives are more reliable today, so the most frequent need for backup is because the operator or user screwed up and initialized the hard disk and wiped everything out," claims Dataquest's Moore. "That's the jeopardy of having a lot of data out there in one basket—you've got to learn to continually back up."

Backups are an integral part of life at KRCC. "We have a tape drive on the system and we get a snapshot of everything once a month or even once every two weeks. But it's the responsibility of each user to back up their data," says Lucas. "They know the inherent dangers. We've had a number of system crashes, and

STORAGE BY LIGHT

The traditional hard disk drive isn't the only storage medium that seems to be growing as fast as users can keep up with it. Just look at optical disks, where a low-end drive has a capacity of 200Mb (about 500 floppies.)

The phrase "optical disk" describes two basic types of storage devices: compact-disk read-only memory (CD-ROM) and write-once, read-many times (WORM) disks. The two are read by lasers, like the audio compact disks that have become common among stereo buffs.

The two devices appear to be developing along complementary lines but with separate uses: CD-ROM for reference material and WORM drives for archiving data. CD-ROM drives commonly store nearly 600Mb of material (equal to about 1,500 floppies), enough to hold several sets of encyclopedia. They are, of course, read-only devices, the electronic equivalent of reference books that can be read or copied in public libraries but can't be checked out.

The ultimate in data storage right now is optical media, capable of storing several times more than a Winchester disk.

Among the software available for CD-ROM drives is the Microsoft Bookshelf, which consists of 10 works such as a zip code directory, *The Chicago Manual of Style*, a world almanac, and form letters. RAM-resident software for getting at the reference material is also included. Information can be copied into documents created by the most popular word processors, but the original material on the compact disk cannot be changed, and users cannot store their own files on the disk.

General Information, Inc., which produces an MS-DOS telephone directory and dialer called Hotline, plans to get into the CD-ROM marketplace with *The National Directory of Addresses and Telephone Numbers*, a portion of which comes with Hotline. The directory, also available in ever-popular paper, contains about 150,000 listings of public and private entities.

But you won't be able to add your own private line to General Information's directory, or any other CD-ROM files. To do that, you would need a WORM drive like the 200Mb version announced as an option with IBM's Personal System/2 family. As the name so aptly says, these drives can be written on once, a reason many corporations consider them a good option for archiving data.

While CD-ROM disks are produced by only a few sources, WORM disks are available to anyone willing to pay nearly $3,000 for the drive. A law firm or a hospital, for instance, could fill WORM drives with closed cases without sending the information to an outside company to be archived. Or a chain of auto parts stores could update catalogs and send them to every store.

When they first became available, optical drives seemed to have limited appeal to users who thought they would never run out of room on their hard disks. As both applications and documents grew in size, however, the drives became very real storage options. And with the release of OS/2, that trend should continue as users explore what they can do with 16Mb of RAM.

Further down the road is a third type of high-capacity optical disk, which will be erasable. Development of erasable media is lagging behind the work being done on CD-ROM and WORM drives because of the more complicated and expensive technology involved, such as the challenge of building two heads (one for writing and one for erasing) rather than one. Among the companies with prototypes of erasable optical disks are Sony, Kodak, 3M, and Philips.

While the early adapters among us are already using optical disks, most users won't even begin to consider switching storage media for at least a couple of years. It will take at least that long for standards to be set in areas like data exchange and disk management.

—Sandra R. Reed

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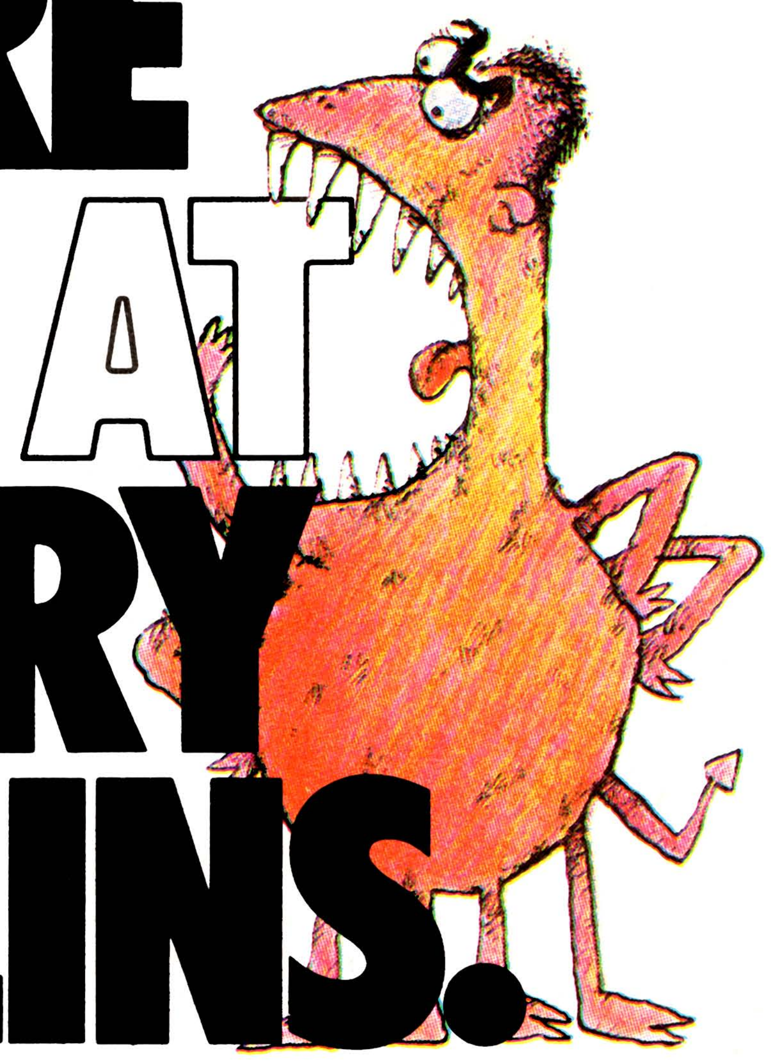

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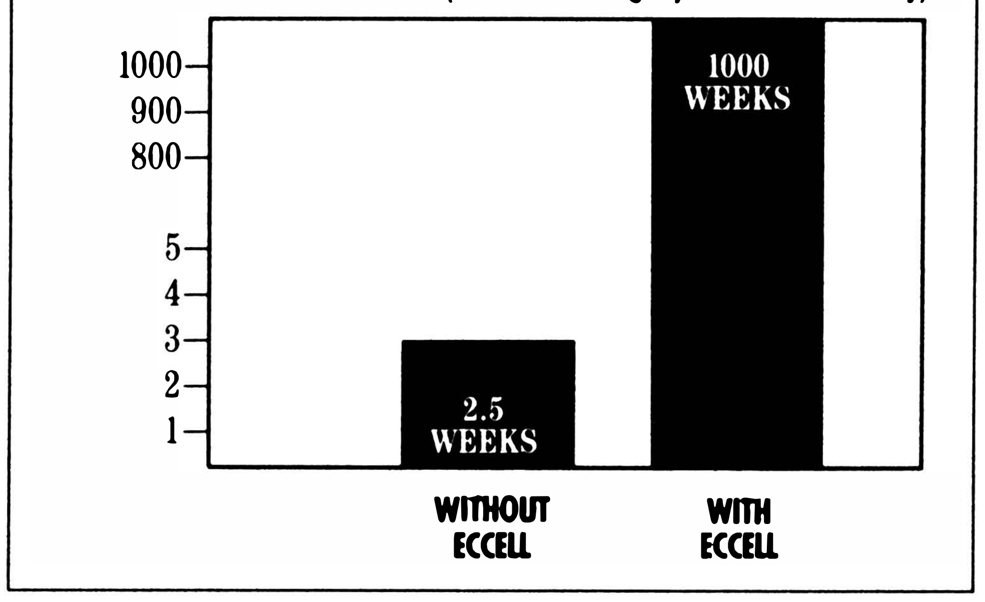

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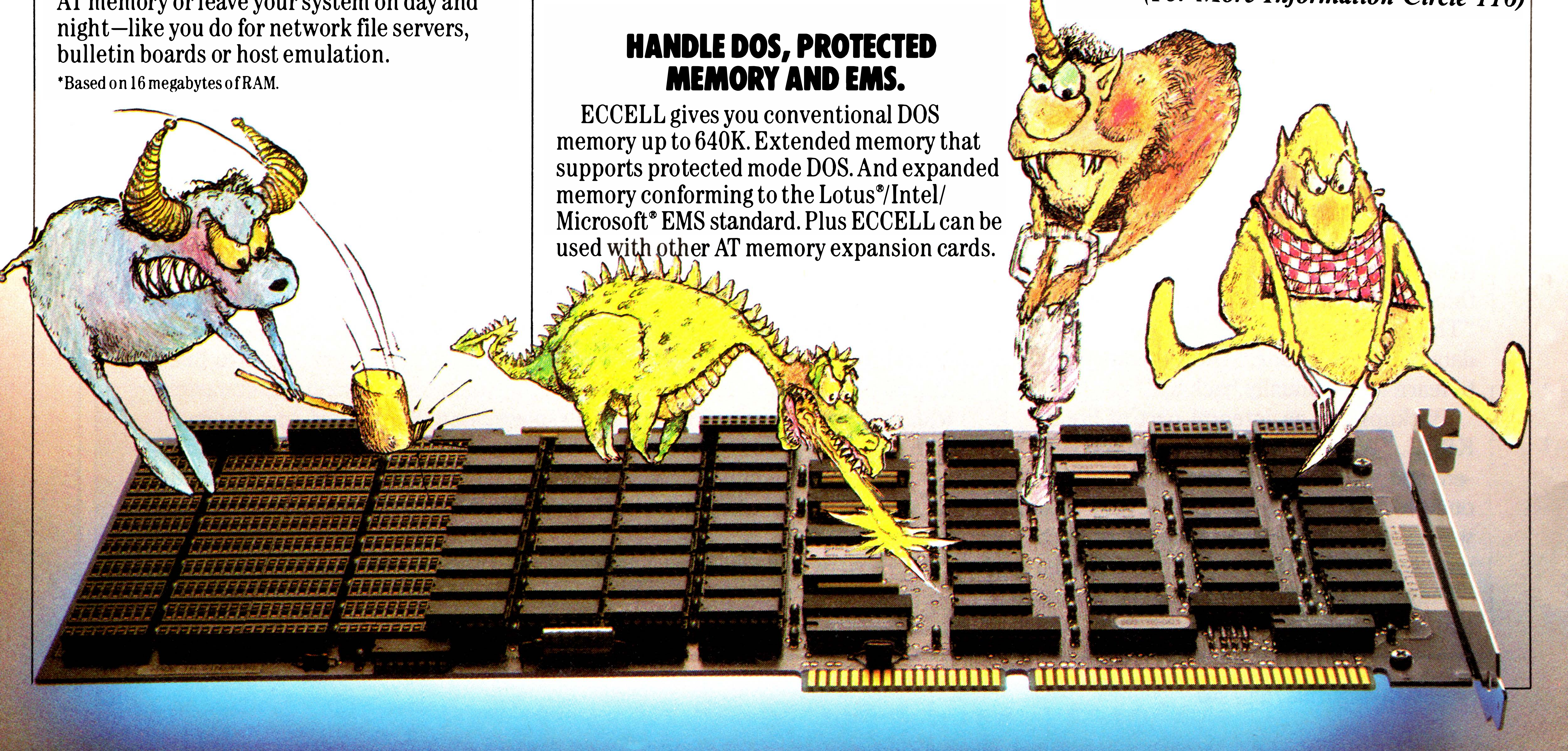


there were a lot of long faces because people didn't have all their information backed up. Most people are very conscious of this now."

They sure better be. Lucas says the network is set up to monitor all the projects in the plant having to do with accounting and cost flow. "Since we produce steam, we have to keep very active records on our production because we're on-line 24 hours each day," says Lucas. "Last year there were 6,000 entries into our data base just for invoices alone."

Ultimately, according to the plan, the Macintosh network will connect to the main computer within the plant. Then production data could be monitored by sensors that the Macintosh would "look" at, replacing manual data entry. One week of such activity, Lucas estimates, yields about 400k of historical data, which is regularly stripped off the hard disk and backed up onto floppy disks.

At Dyer/Brown, Swenson says backups have become routine. "We only read or write a drive when changing parts of drawings or doing reports," he says. "We basically do backup from C to D and from E to F. Quickly and routinely, we have our data updated and ready to go several times each day. That way we're able to keep revisions of drawings fairly current with a limited chance of losing data."

Backups are done almost hourly at American Appraisals, a valuation firm located in Milwaukee, Wisconsin, which appraises sports teams and corporations in the process of reorganization or merger. (The company appraised Chrysler when it needed loans from the government a few years ago.)

Steven Schulz, a senior personal computer specialist with the firm, says AA also upgrades inventories for companies. For this task, it uses 80Mb hard disks in several IBM PC ATs on-site. These create huge inventory data bases (more than 100,000 records), which are uploaded to its IBM mainframes.

"Our people collect data on-site with hand-held computer units that ask for specific information on each item, and when the unit is full it is downloaded into the PC," Schulz explains. "The program attempts to match the new data with the master data base. If something isn't in the data base, it is added. If it matches, then it was already inventoried. Of course, we do backups every couple of hours."

Once users do minimize the risk from having greater storage, they report increases in productivity.

"Since we worked with such big files, we were having trouble fitting things onto the 40Mb disks," says Schulz. "Our biggest spreadsheet is about 2 megabytes, and we create different versions so there's always a lot of them out on the disk. Our company is very heavily information-oriented, and now it's becoming more cost effective to buy the bigger disk drives. Today they're a very good value, around $1,200 for a very high-performance hard disk."

WHEN TO TRADE UP

For many potential hard disk users, the question isn't "Do I need a hard disk?" It's "Do I need a huge hard disk?" Here are some ways to gauge your needs.

The Connectivity Factor As businesses grow, so does the way they handle information. If you need to share files with others over a local area network, a large-capacity drive can make that task easier while leaving room for growth. One huge hard disk on a file server can also save storage space on the local stations because you won't have to have copies of communications and applications software on every machine.

The File-Size Factor As applications that once ran only on minis or mainframes migrate to the MS-DOS environment, users often have to find room for large application files, large data files, or both. Computer-aided design and manufacturing programs, for instance, can require a couple of megabytes per file, filling a "normal-size" hard disk in a few minutes.

The Junk Factor Look at the disk drive that you have now. One reason higher-capacity drives are more popular is that hard disks seem to attract junk. Think back to what it was like when you used a floppy system. You were continually cleaning up your disks, removing the duplicate backup files, and consolidating data. You constantly avoided the dreaded "disk full" message.

But if you now have a hard disk, chances are you have a lot of files with half-written memos, forgotten letters to your mother, outdated resumes and resignation letters written in the heat of a moment, old E-mail, and various downloads from the sundry information services.

You can actually fill a disk with all that garbage. So if you're feeling magnetically (and, you fear, illogically) drawn to your computer dealer to buy an 80Mb hard disk, sit down and go through all those directories and take out the trash. If after the janitorial duties you're still operating at 75 percent capacity or higher, you may have a legitimate need to indulge in a huge disk.

—D.C.

These drives are rapidly making themselves indispensable. "Everything we do is done on that [hard drive] system," notes ARA's Wallace, who went on-line with it three years ago. It allows his company unparalleled response time.

"For example, the IRS just came out with a new set of specifications for treating the fringe benefit value of the use of a company car," he explains. "We were able to quickly send out a synopsis of the law and an application-format worksheet for the cities to use to compute their tax liability for each car in use."

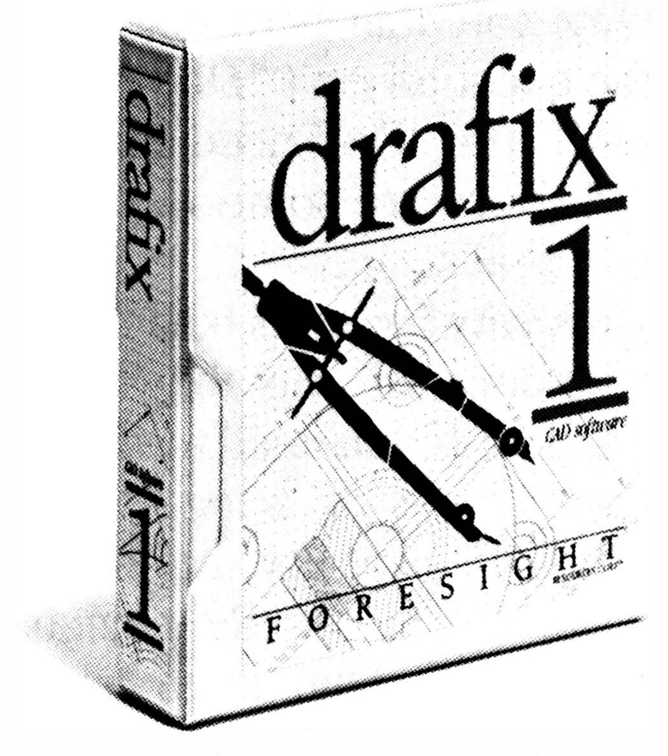
Wallace is so happy with the hard drive he's already scheming to make another purchase. "I'd like to have another 70Mb hard drive right next to the first one, with an automatic backup feature," he says. "That way you have everything you need in terms of sharing and networking, and also the safety of literal backup if anything does happen."

At Dyer/Brown, Swenson says that the firm has become an intensive user of PCs since buying the large hard disks. Set up so that the first 60Mb disk is partitioned into C and D drives of 30Mb each, the second 60Mb acts as a data base for a library of standard elements of drawings that can be pulled into an electronic blueprint. An enormous G drive is a virtual disk (a means of processing more data than the computer can hold in RAM by swapping the data between the memory and the drives) into which the entire CAD program is loaded.

"Many CAD systems tout lots of layers, but they all hit a limit in terms of file size," boasts Swenson. "We haven't had that problem. We can really utilize all the layers of the software instead of running out of space before we get information on all of them."

Such stories show that high-capacity hard disks have an important role to play in commerce. Their growing popularity may be the first big step toward a "paperless society," since it soon might be easier to look through hundreds of records on a computer than to rummage through a file cabinet. ■

Revolution.



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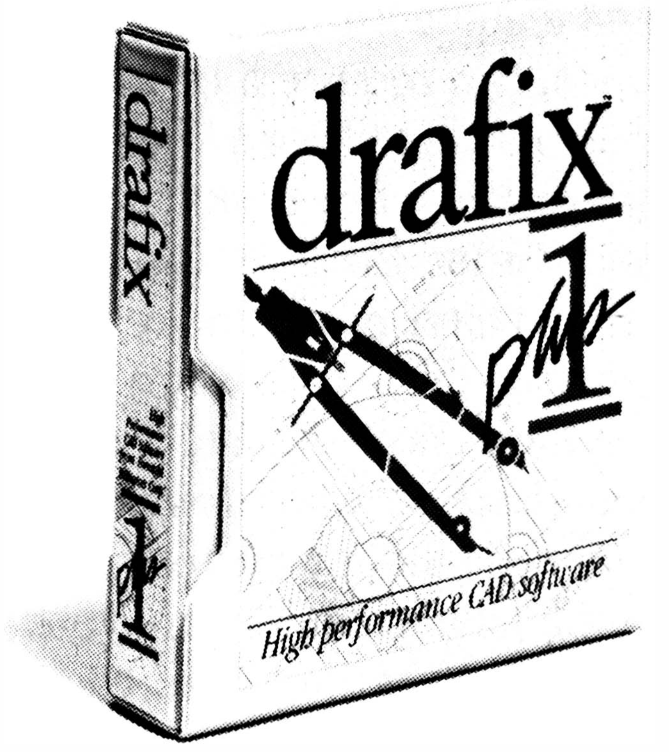

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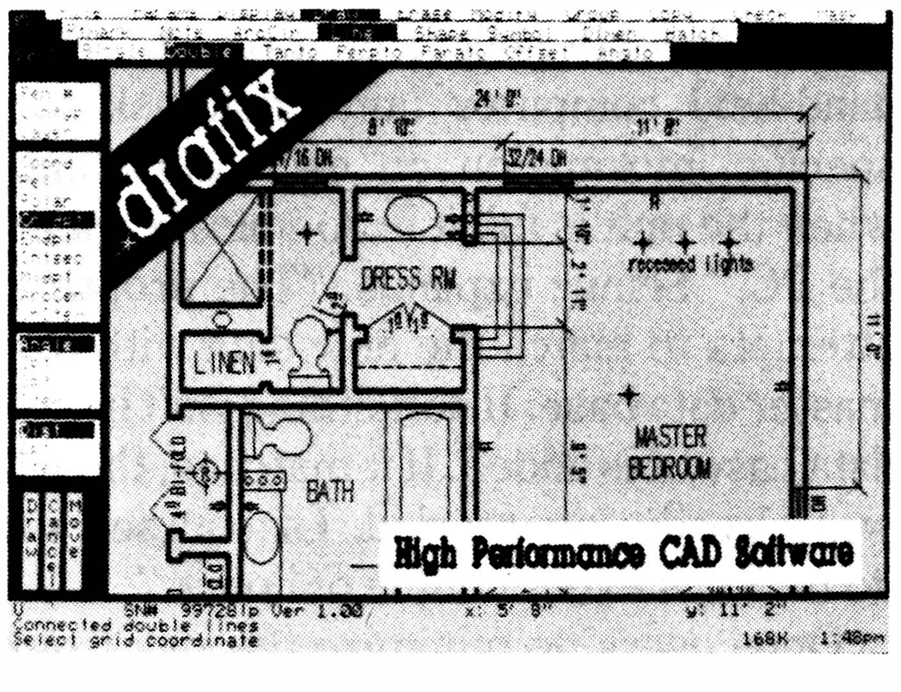
Drafix runs on IBM PC and compatibles — Atari ST version coming soon.



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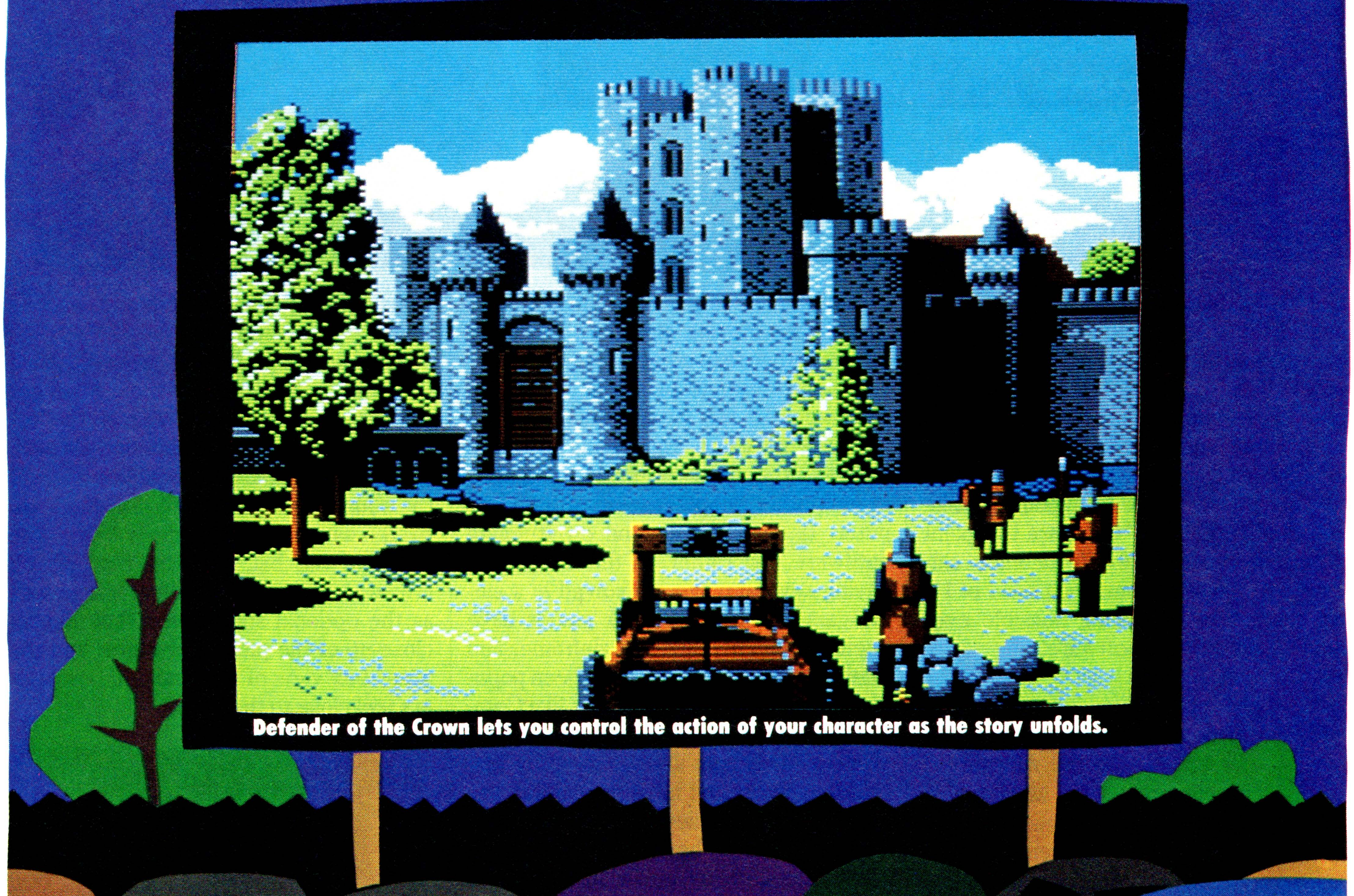
WHAT'S NEW IN ENTERTAINMENT SOFTWARE



Defender of the Crown lets you control the action of your character as the story unfolds.

Today's designers are creating software that ranges from fabulous network games to rich sports simulations to interactive movies. They're expanding the definition of computer gaming to include creativity software like music, paint, and animation programs. And while they are looking forward to the advances that technology will bring, at present they are concentrating mainly on enhancing existing genres rather than developing new ones.

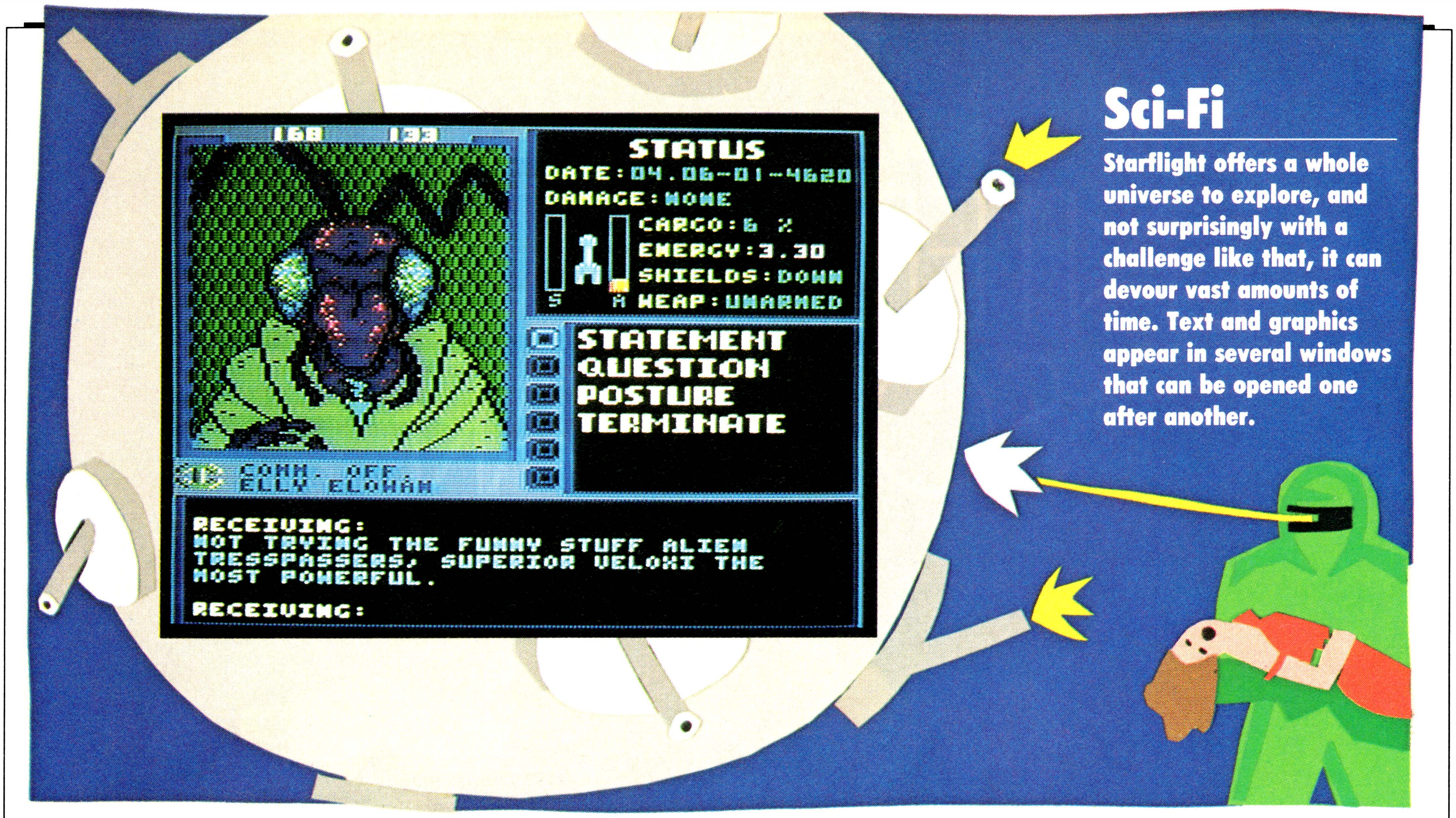
Two parallel trends are reinforcing the evolutionary (rather than revolutionary) state of entertainment programs today. The first is that low-cost PC compatibles are moving into the home in great numbers, bringing more mature users

No matter what hardware you use, game designers are busily looking for ways to keep you entertained.

by Denise Caruso

Denise Caruso wrote about telecommunications in June.

RICHARD OSAKA



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ELLY ELOMAN
RECEIVING:
NOT TRYING THE FUNNY STUFF ALIEN
TRESSPASSERS, SUPERIOR VELOXI THE
MOST POWERFUL.
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Sci-Fi

Starflight offers a whole universe to explore, and not surprisingly with a challenge like that, it can devour vast amounts of time. Text and graphics appear in several windows that can be opened one after another.

RICHARD OSAKA

to a marketplace that has been the province of those in their teens and twenties. The second is that powerful 16-bit computers like Amiga, Atari ST, Mac, and Apple GS are encouraging innovative uses of graphics and sound. Adult users are looking for challenge as well as stimulation in games, and are even helping make so-called "creativity" software like paint programs into a viable entertainment category. At the same time, the power of 16-bit computers is making possible ever more realistic game software.

The great leap forward Amiga made using custom processors for sound, and the widespread acceptance of Macintosh's graphical interface, have spurred development of true sound reproduction and sophisticated on-screen picture systems throughout the industry. "The marketplace is really just getting a hint of the audio-visual potential for computing—an aspect we didn't even think about in the past," says Trip Hawkins, founder and president of Electronic Arts of San Mateo, Calif. "In the market that existed a couple years ago, a text adventure could be a leading product. I don't think that's possible today."

Eventually, upcoming optical technologies like Compact Disk Read-Only Memory (CD-ROM) drives and the CDI (Compact Disk Interactive) standard will have enormous impact on the entertainment market because of their vast capacity for storage of graphic images and video. But for the moment, Hawkins and his industry colleagues emphasize that game designers are moving ahead with existing genres rather than creating new ones.

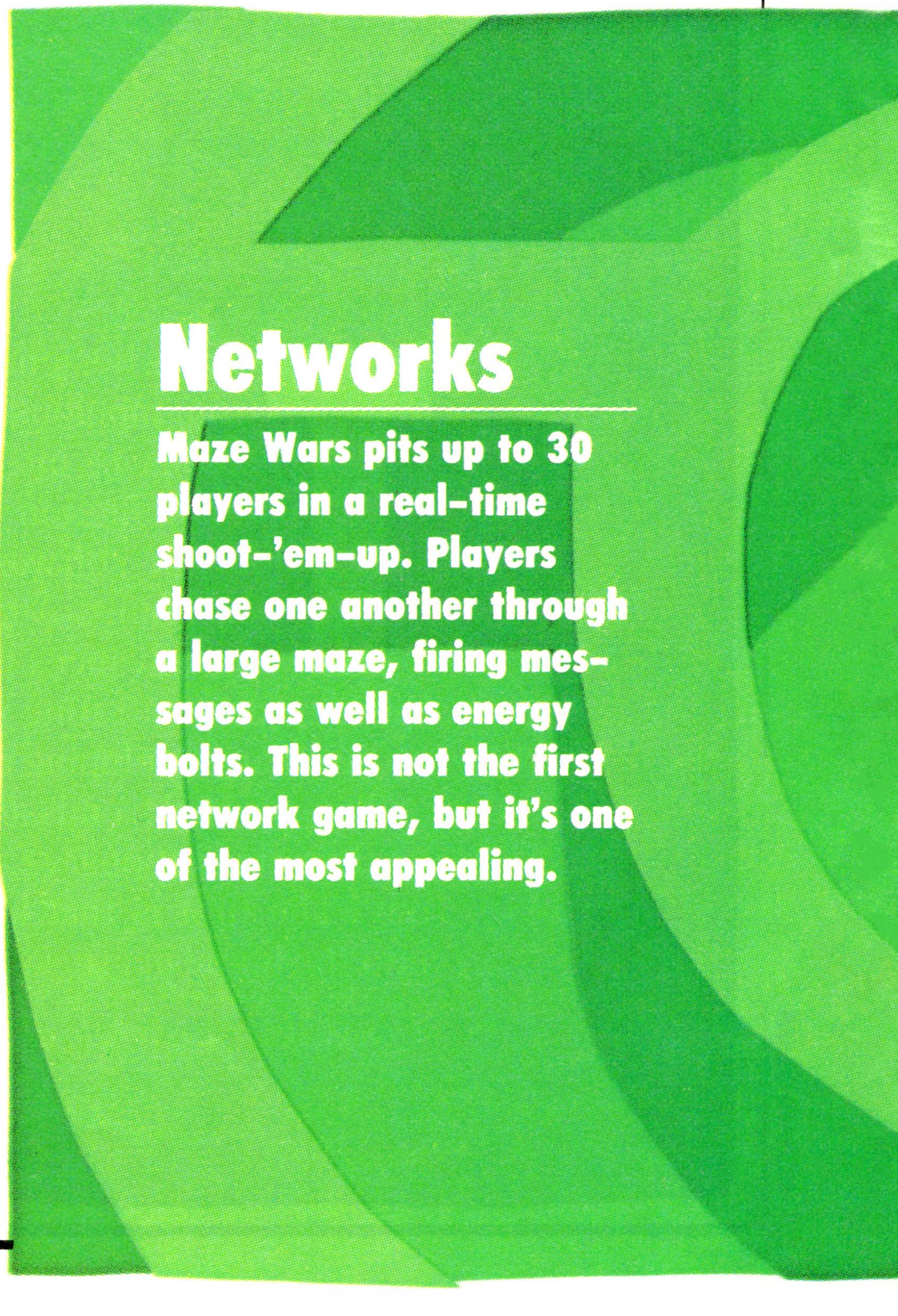
A good example of this is a relative newcomer to the entertainment world: the network game. Borrowing from the arcades, the network game is played against other people instead of the computer. It does not depend on stunning hardware, but rather on the concept of having several players involved in a single game. In fact, network games have been around for years on mainframes and minicomputers, and have long been popular with subscribers to services like CompuServe. With the introduction of Maze Wars, a Macintosh shoot-'em-up by MacroMind, PC-based network gaming has the potential of achieving success.

Maze Wars can be played over the Appletalk network by up to 30 people, or two players can do battle using a modem. There's the thrill of chasing an opponent around the maze via computer—and the fun of playing with others is heightened by the ability to send customized messages to those who are zapped.

"What I really want to do is a version of the program in which you can play through Tops (the Centram network that lets Macintosh communicate with IBM PCs) or over a modem and have a Mac play against an IBM," says Marc Canter, the president of MacroMind and an avowed Macintosh zealot.

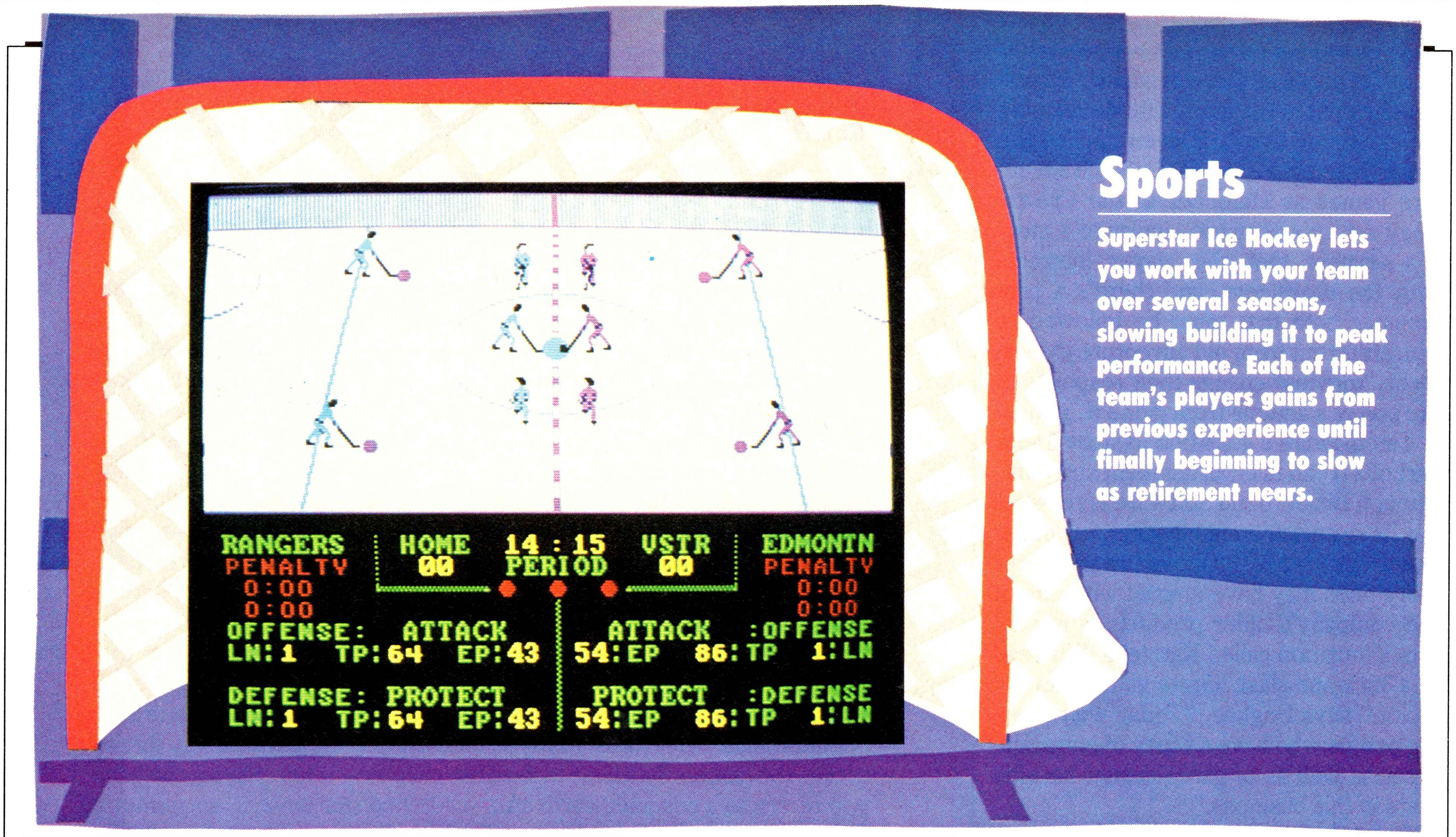
Sports games are part of the trend toward more challenging and realistic simulations. Most of the entertainment companies, from Electronic Arts to Activision to Mindscape, have released new versions that let you pick teams and coach—or just play, arcade style.

The design of Earl Weaver Baseball (released in May by Electronic Arts) got a helping hand from Earl Weaver, the former manager of the Baltimore Orioles, himself. Its audio-visual effects include the sounds of a real baseball game, digitized—with the announcer's voice, the crack of the bat, and the roar of the crowd. An instant replay feature, as well as the optional split screen that gives a close-up of the pitcher or batter and the press box view of the stadium, lets players feel close to the action.



Networks

Maze Wars pits up to 30 players in a real-time shoot-'em-up. Players chase one another through a large maze, firing messages as well as energy bolts. This is not the first network game, but it's one of the most appealing.



Sports

Superstar Ice Hockey lets you work with your team over several seasons, slowing building it to peak performance. Each of the team's players gains from previous experience until finally beginning to slow as retirement nears.

You can strategize, if you'd like, by drafting players and making the lineup. The game comes with a disk of old-time baseball players for draft purposes, but a special disk with current team members will be shipped every year, according to Electronic Arts. And the game lets you design your own ballpark (handy if you happen to live in San Francisco, where nearly everyone hates Candlestick Park).

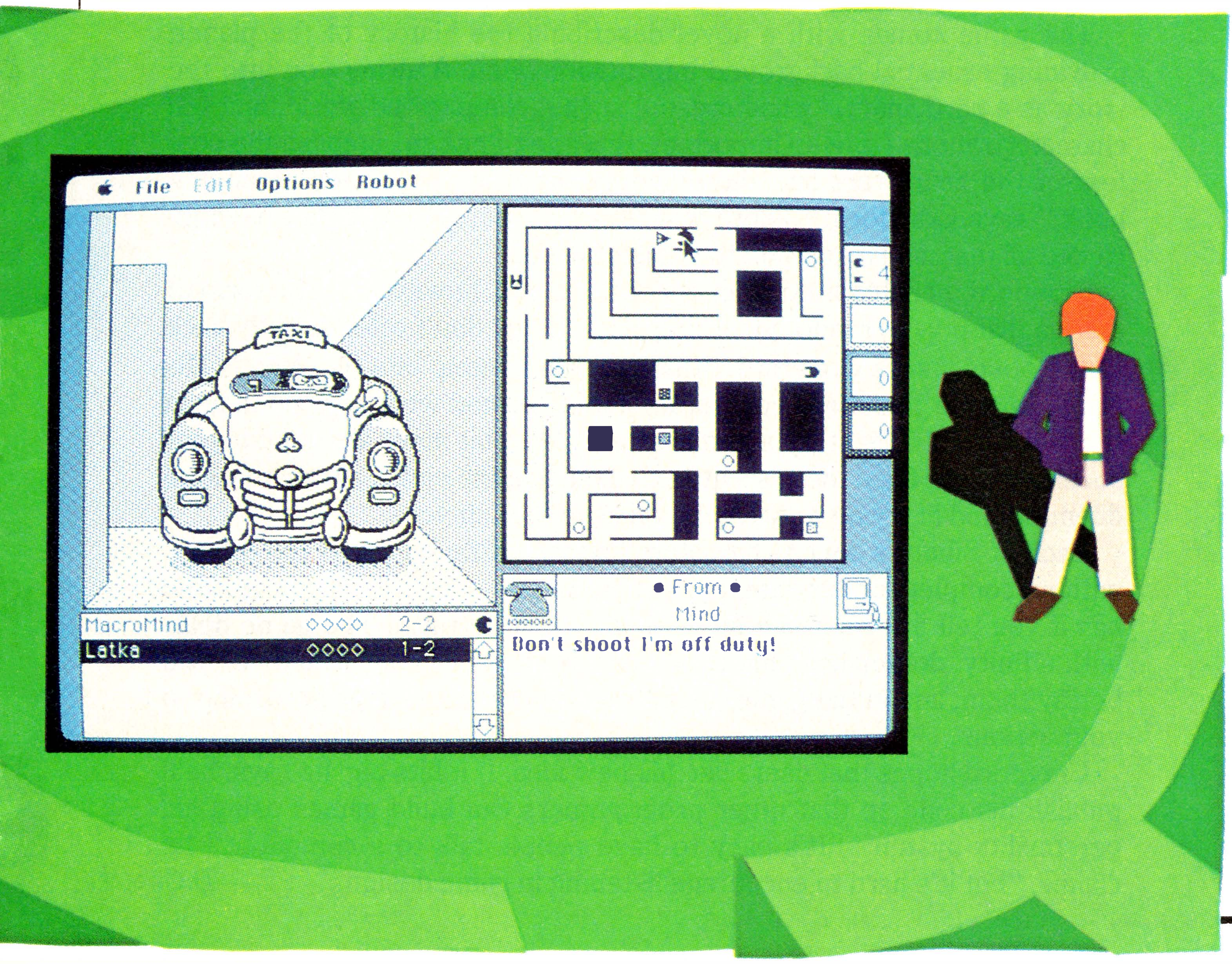
"Earl Weaver Baseball is a good example of enhancing what already exists," says Electronic Arts' Hawkins. "It's not a new genre, but lots of things people want to have in a game are being done the way they want them to be done."

Then there's Activision's Championship Football, which president Bruce Davis calls "the only football game with perspective." Instead of being in the bleachers, you're a player on the field. Rolling screen animation gives the sensation of moving up and down the field. You can choose from 34 offensive plays, 12 defensive alignments, kickoffs, field goals, and punts.

And as with any good football game, you get those rough-and-tumble sound effects—the quarterback signaling from the line of scrimmage, the clash of pads, the pounding of cleats as your team runs the play. Which player you become depends on the play you call—you may be the quarterback, the wide receiver, the running back, or another player.

Another rough-and-tumble sport, ice hockey, has been digitally immortalized by Mindscape. SuperStar Ice Hockey is so sophisticated, "It gives the appearance of being artificial intelligence," boasts company president Roger Buoy. As in the other sports games, you have a choice of "just" playing, or taking the game further. If you want, you can start off as a new franchise coming into the Superstar league and play for nine seasons, each year bringing up rookies from the minors and trading players with other teams. As play progresses, skaters actually age and hit their peaks. In addition, each of the 16 players on the roster has offensive and defensive skills. You bring them up, coach them, and make them play better. Their improvement even depends on whether you play at home or away—so they get experience on different ice. And there's a referee who makes sure the skating stays within the rules of ice hockey. In another realistic twist, the players age, hit their peaks, and then decline, just as real athletes do.

Adventure games nearly hit an unhappy peak of their own a while back when the computer industry slumped. State-of-the-art graphics and animation have provided a second wind, while the advent of literary or cinematic story lines has add-



MacroMind ◇◇◇◇ 2-2
Latka ◇◇◇◇ 1-2

Don't shoot I'm off duty!

ed to the scope of these products. Mindscape has put great effort into developing the cinematic touch. It even applies the term, "interactive movie," to such adventure games as Defender of the Crown. They set up a scenario similar to a movie's—except that the player interacts with the characters, and there's a progressive path that must be followed to win. Different from old adventure games, these "movies" change their response to the player's actions from game to game.

Cinemaware's attention to story line is part of a trend in entertainment software. Though Broderbund Software is revamping its entertainment division, producer Don Daglow says the move toward better story lines may have started with one of the company's older products, a martial arts simulation called Karateka. "Instead of a hack-and-slash karate game, this has a plot," says Daglow. "Today we're seeing people who have a sense of entertainment as well as of game design become stars in this business."

Karateka's author, Jordan Mechner, a would-be screenwriter, "has used film to help build his animation, which is extremely smooth," Daglow says. "Once he had the cinematic feeling in the story style, he added it to the animations."

"Today's stories are better developed. They're becoming more literary as professional writers get involved in story development," says Hawkins of Electronic Arts. "We're squeezing a lot more performance out of the machines, but it's a combination of improvements within the technology—which makes the realism possible —and the quality of the people who are developing the themes that gives the games their dramatic interest."

Some games use history as a starting point, substituting fact for plot invention. Such games as Strategic Simulations' Gettysburg: The Turning Point, and its The Battle of Antietam, let users reenact Civil War battles. These games, which faithfully emulate the actual balance of forces, appeal to players willing to take their entertainment seriously. A game can run for a couple of hours.

For other game players, the future offers new horizons. Electronic Arts' Starflight provides an entire universe to explore, complete with alien races in a game that can consume hours.

Apart from games, creativity software is a hot new area in home entertainment. Music, paint, and animation programs, which are being introduced on the more capable machines like Amiga or Atari ST, are growing in popularity. "Every human being does want to be creative," MacroMind's Canter says. "Ninety percent of the people who bought [MacroMind] MusicWorks said 'I've always wanted to be a musician.' Creativity software is becoming entertainment."

MacroMind has a heavy investment in such software. MazeWars is the company's only real "game"—the rest of the line consists of products like MusicWorks; ComicWorks, a comic-book generator and a full paint program; VideoWorks II, an animation program that runs in color on the new Mac II as well as in monochrome on the standard models; and VideoWorks Interactive, which has everything in VideoWorks II but adds an authoring language that enables users to create their own animated video games.

These capabilities may eventually create a hybrid genre of entertainment software: desktop video. Hawkins of Electronic Arts thinks other home computers will soon join the Amiga in allowing users to synchronize a standard video signal with computer video, so they cân integrate graphics from a video source with graphics from a computer, producing graphics-video combinations of television quality.

Electronic Arts employees recently put together such a videotape using the company's Deluxe Video program in combination with graphics, animation, and regular video footage shot at the company's San Mateo headquarters.

"They did the whole thing just like an MTV video," says Hawkins. "It was completely home-produced, amateur—but it was so slick. When you think of the several million owners of video cameras, and how people are really into video, you can see how people at home would have fun doing their own video productions."

Developments in optical technology, like CD-ROM, and new standards like compact disk interactive (CDI) should also enhance the link between the video world and computers. Although some manufacturers are reluctant to explain how they plan to implement these technologies, the companies are alert to the potential. Electronic Arts has already established a CDI Division. Hawkins speculates about a CDI product that, in combination with his company's Deluxe Paint program, might draw on the disk's enormous storage capacity to put the entire history of art on disk. "We could give them a whole library of things to work with," says Hawkins.

Canter of MacroMind sees CD-ROM as a big opportunity in the entertainment market, and conceives of a program called City Games on CD, which would provide a visual front-end to a huge data

The Next Chapter In Interactive Novels

Skeptics believed that when the sun rose on the personal computer era, twilight had come to the age of libraries and books. That's not to say books won't vanish someday—but for now, some of the best games on the market (or soon to be) are striking combinations of the two.

The first product to put computers and books together with fun and innovation was Broderbund Software's Where in the World is Carmen Sandiego, and more recently, Where in the USA is Carmen Sandiego. Using a packaged combination of software and the *World Almanac* or *Fodor's USA* travel guide, you track a notorious criminal gang, and the game gives you clues that, unless you're Lowell Thomas, you wouldn't recognize unless you looked them up. The program is popular in schools because groups can work together to ferret out needed information.

A product that makes the combination of book and computer even more intrinsic is Portal, sold by Activision. Billed as an interactive novel, Portal is a science fiction adventure without the interactive feature that "understands" the words you type onto the screen. Instead, you directly access the game's data base to read the chapters. When playing the game, you return to a deserted earth after a botched star voyage, encountering Homer, an organically grown artificial intelligence, who's described as "the final link to the past and your only conduit to the future." But Homer's something of a geezer, and the trick is to get him to communicate the information you need.

In both examples, as is typical for most games, you interact with the computer, but—in truth—with only the illusion that the computer is interacting with you. That has always bothered premier game designer Chris Crawford, author of Balance of Power (another game with a book to go with it). Crawford takes a radical tack with his new game, Siboot, to be released later in the year by Mindscape. "In most games," says Crawford, "you can't really alter the outcome."

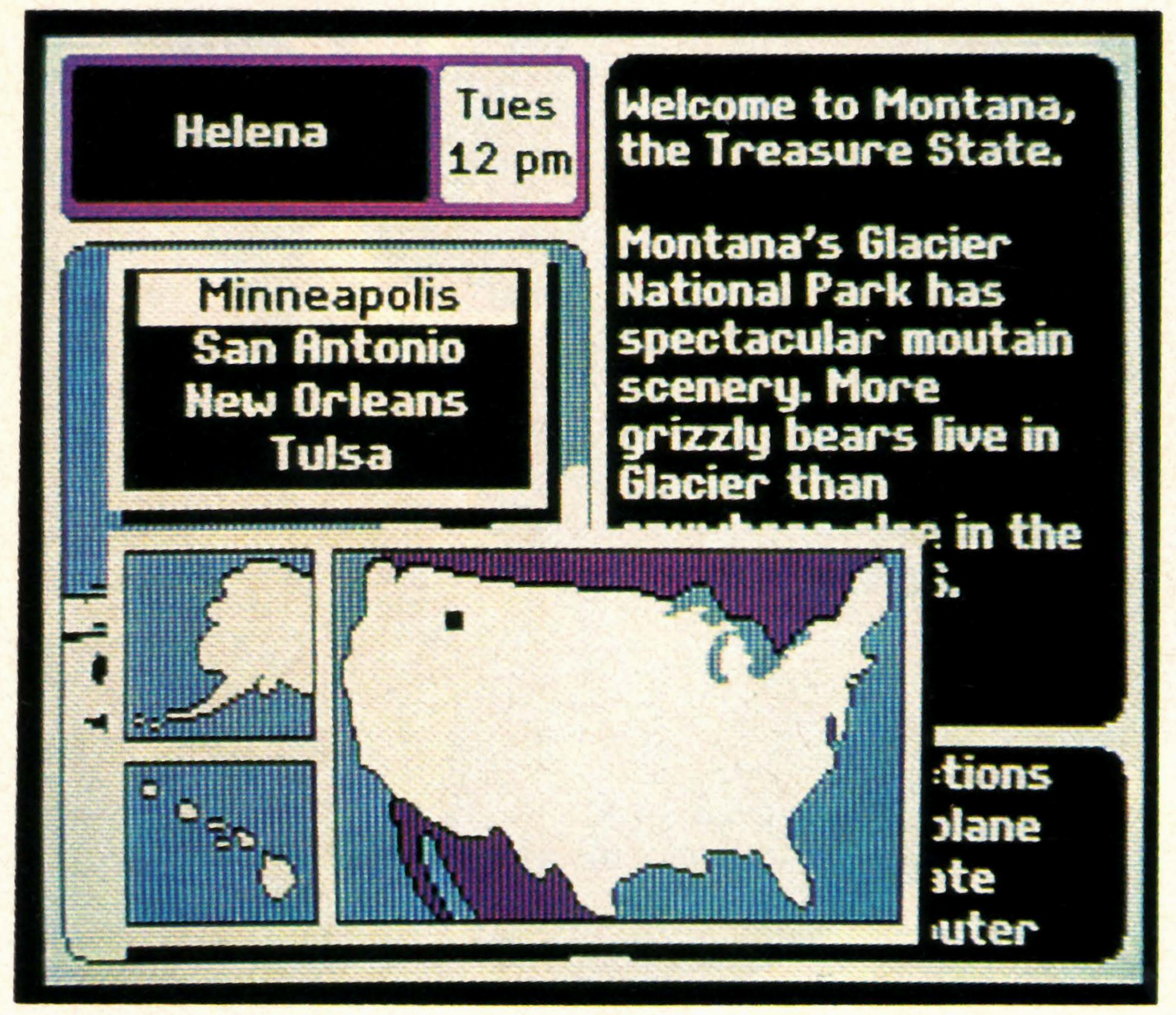
Not so with Siboot. In this game, characters are engaged in conflict for a position of leadership on an alien moon of a distant planet. To simulate this situation, Crawford created what he calls an artificial personality system, where "The personalities in the game don't change, but the relationships between them do."

The game comes with a novel describing the history of the planet, providing essential background information while drawing you into the story as a participant. "I had created such a complicated world, and the characterizations were so important, that I felt I had to establish the context of the characters and the universe that they populated through a book," says Crawford. "There was no other way. We couldn't have included all that information on the [game] disks."

Crawford included little snippets of the novel, however, in the form of stories that pop up randomly during play. "They don't refer directly back to the novel," says Crawford. "Instead, you'll bump into old What's His Name, and the game tells you a story about him and what he used to do in the 'old world.' The story somehow tells you a bit more about how your society works. Then there's a little challenge at the end; it creates a moral dilemma, and in trying to solve it, you have four choices."

Each of Siboot's seven characters knows a little bit about the others, without complete understanding. Cutting deals—i.e., 'I'll tell you what he has if you tell me what she has'—is an act of betrayal. The game deals with affinity, dominance, and trust. You are loyal to your friends or you betray them, and in the game, their reactions to you change according to your actions.

Crawford hopes that users like his new idea. If it hits big, he says, he'll publish his code so that other programmers can build games using his personality system. "It's easy to have people talk to a computer," he claims, "but it's hard to encourage listening in game design." —*D.C.*



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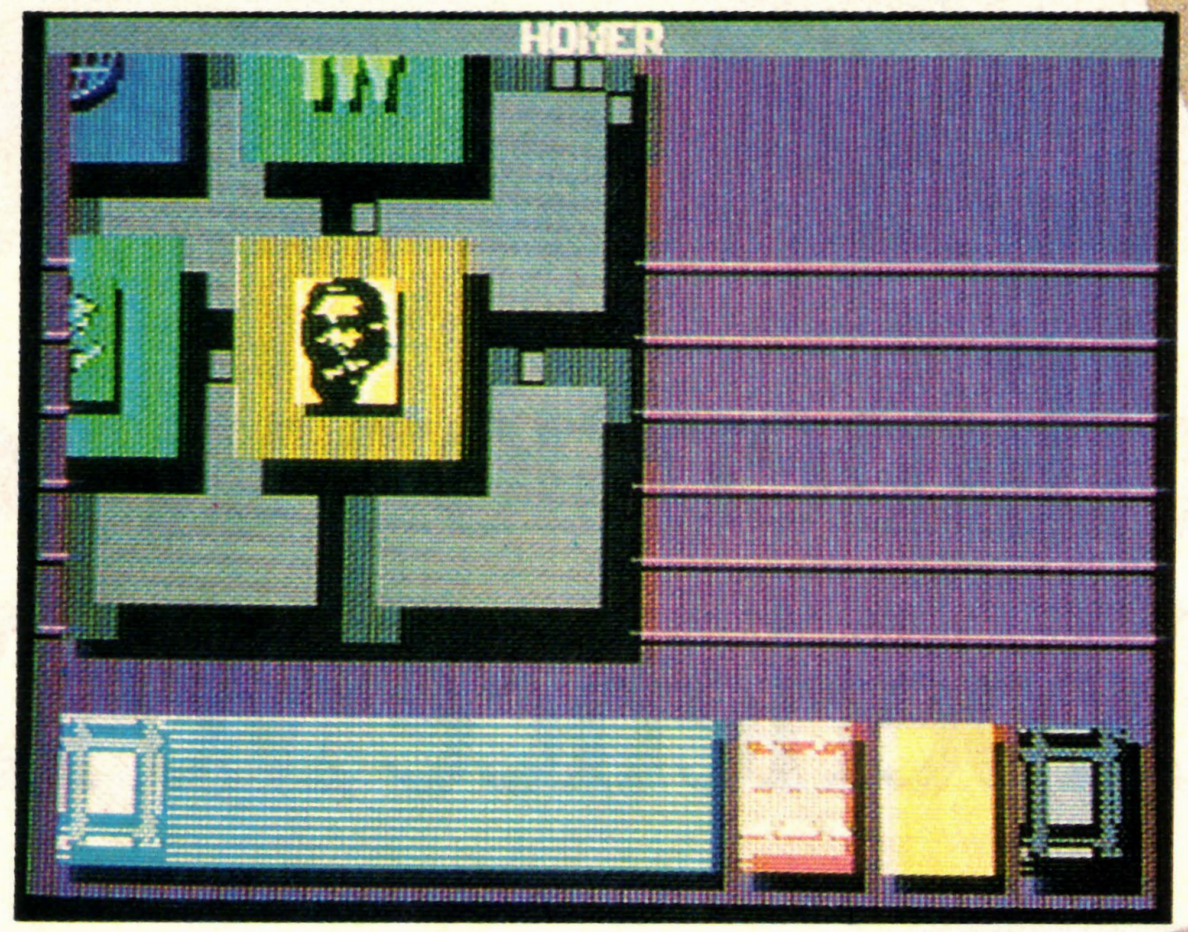
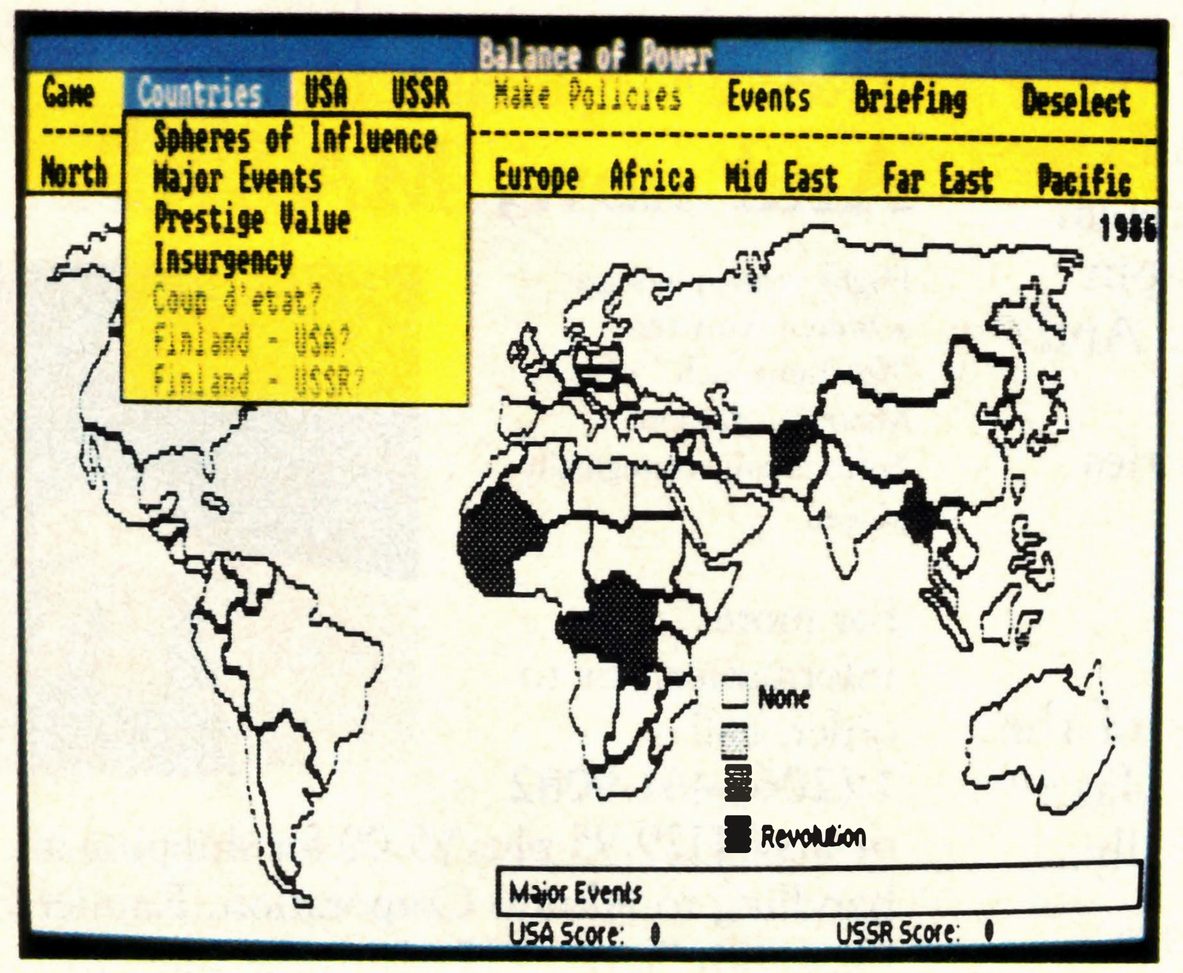


Portal bills itself as a true interactive novel. You communicate with Homer, an "artificial intelligence," to read each chapter; the information so gained is vital to the game.



Balance of Power tries to simulate many of the factors that actually make up global politics. An opt onal 300-page book offers some of the finer points of international power brokerage.

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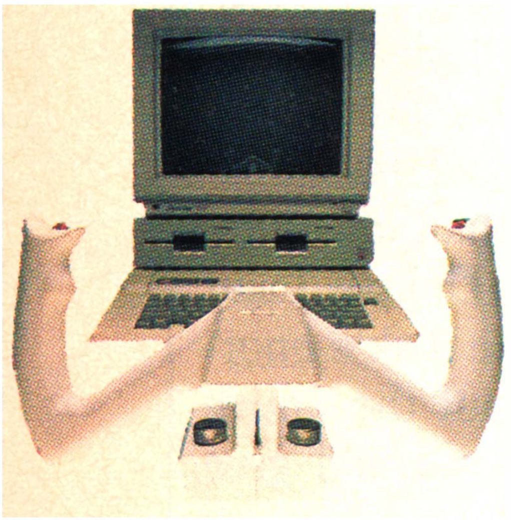

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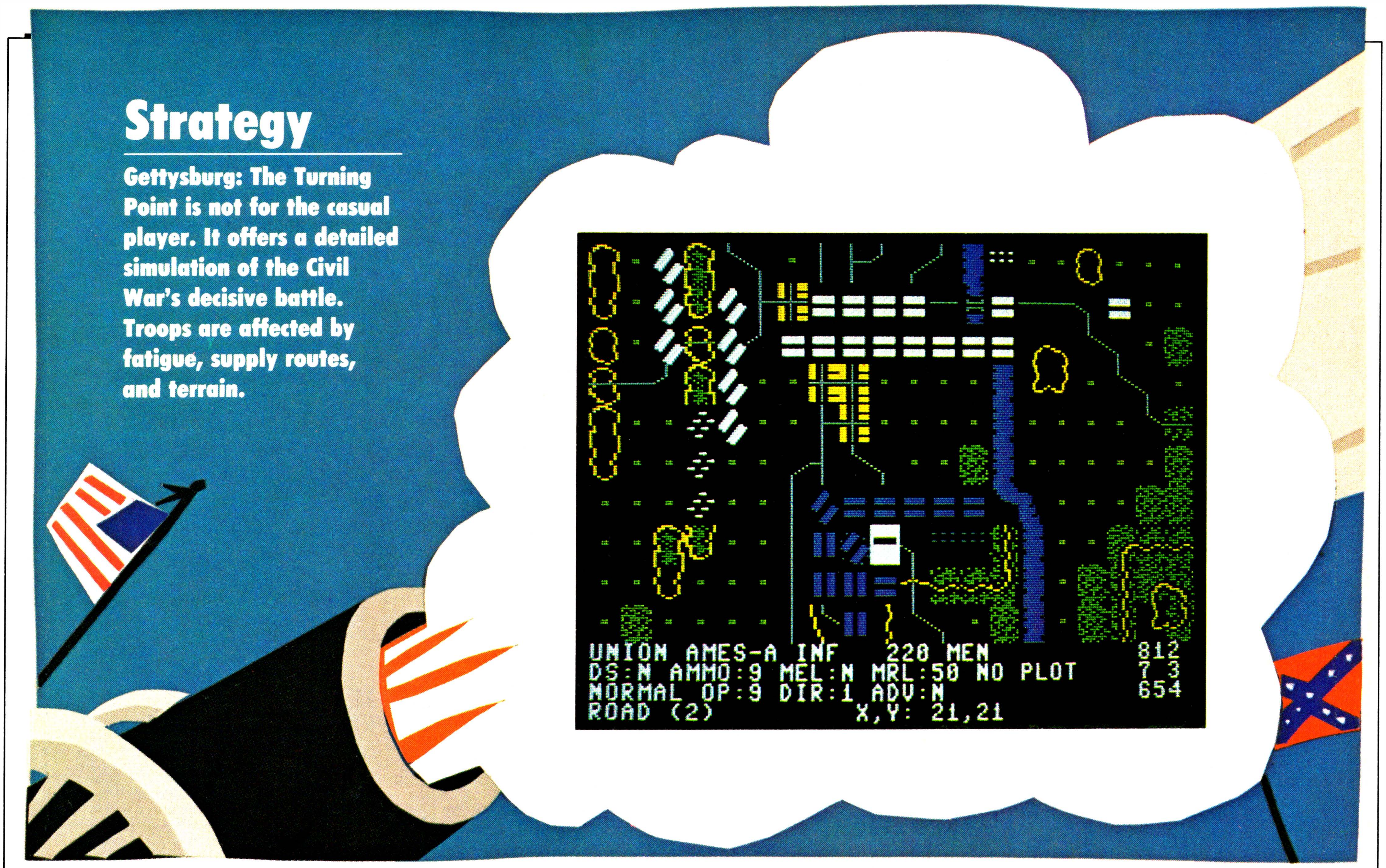
Strategy

Gettysburg: The Turning Point is not for the casual player. It offers a detailed simulation of the Civil War's decisive battle. Troops are affected by fatigue, supply routes, and terrain.



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UNION AMES-A INF    220 MEN      812
DS:N AMMO:9 MEL:N MRL:50 NO PLOT  7 3
NORMAL OP:9 DIR:1 ADV:N          654
ROAD (2)          X,Y: 21,21
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RICHARD OSAKA

base of educational games. "You'd have a map of a city, and you could double-click on the mouse, zoom in, and drag your car down the street," says Canter. "Then you could put it in a library, double-click on a Grolier encyclopedia menu, and get into a whole raft of educational games."

Canter has also dreamed up what he calls the "dinosaur disk," which would put the classic time line of the planet's life forms on CD. "In one-sixteenth of an inch, you could put the entire history of man," says Canter excitedly. "You'll double-click anywhere on the time line and wham—you'll be at that point before animals were alive, and you'll be able to see where the plate tectonics were. Has California skidded up the side of North America yet? Once you get to the animals, you'll have Darwinian evolution charts and tree structures for animals and mammals. As you go through time, you'll be able to see how evolution works. That could be 50 CD-ROMs right there, and we haven't even started on mankind and civilization yet."

Of course, since CD-ROMs are still only a gleam in the eye of those creating home entertainment, many manufacturers won't consider developing software for the systems. The market will have to expand before they commit the development dollars.

And lest we get too thrilled about what's coming, let's not forget the drawbacks. Game designers are finding they are cramped on a number of technological fronts. For one, clones are never quite the 100 percent compatibles they are claimed to be. Consequently, software games often don't work quite right on them. But more important to users, the IBM PC and compatibles aren't really powerful games machines. Since the IBM wasn't designed as a graphics machine, entertainment leaders like Mindscape's president, Roger Buoy, complain "We spend most of our time trying to make an IBM PC perform like a Commodore 64."

A big problem for designers now is the proliferation of makes of computers, stretching their resources if they want their products on a wide variety of systems. The two newest computer models, the Macintosh II and the new IBM Personal System line, have virtually no installed base as yet, but designers will be eager to develop for them when enough machines are sold to make it worthwhile.

That decision is going to be a gamble. New equipment always suggests new directions in software, especially for games. Whether it's TV animation and graphics wedded to a personal computer, the massive video memory of CD ROM, or hot new computers, the new technology is always a risk and a promise to game manufacturers. "We're all watching carefully," says Broderbund's Daglow. "It's going to be years of trying and failing, of great experiments that fall flat and mistakes that make it big. The obvious is never enough." ■

Entertainment Software Sampler

Portal; Championship Football; **Activision, Inc.**, *PO Box 7287, Mountain View, CA 94039; (800) 633-4263. (For more information, circle 515.)*

Where in the World is Carmen Sandiego; Where in the USA is Carmen Sandiego; Karateka; **Broderbund Software**, *17 Paul Drive, San Rafael, CA 94903; (415) 479-1170. (For more information, circle 516.)*

Earl Weaver Baseball; Starflight; Deluxe Video; The Official America's Cup Simulation; **Electronic Arts**, *1820 Gateway Drive, San Mateo, CA 94404, (415) 571-7171. (For more information, circle 517.)*

Maze Wars; MusicWorks; ComicWorks; VideoWorks II; VideoWorks Interactive; **MacroMind**, *1028 West Wolfram, Chicago, IL 60657; (312) 327-5821. (For more information, circle 518.)*

Defender of the Crown; Superstar Ice Hockey; Cinemaware; Balance of Power; Siboot (unreleased); **Mindscape, Inc.**, *3444 Dundee Road, Northbrook, IL 60062; (312) 480-7667. (For more information, circle 519.)*

Gettysburg: The Turning Point; The Battle of Antietam; **Strategic Simulations, Inc.**, *1046 N. Rengstorff Ave., Mountain View, CA 94043. (415) 964-1353. (For more information, circle 520.)*

(For more information on all products listed above, circle 521.)

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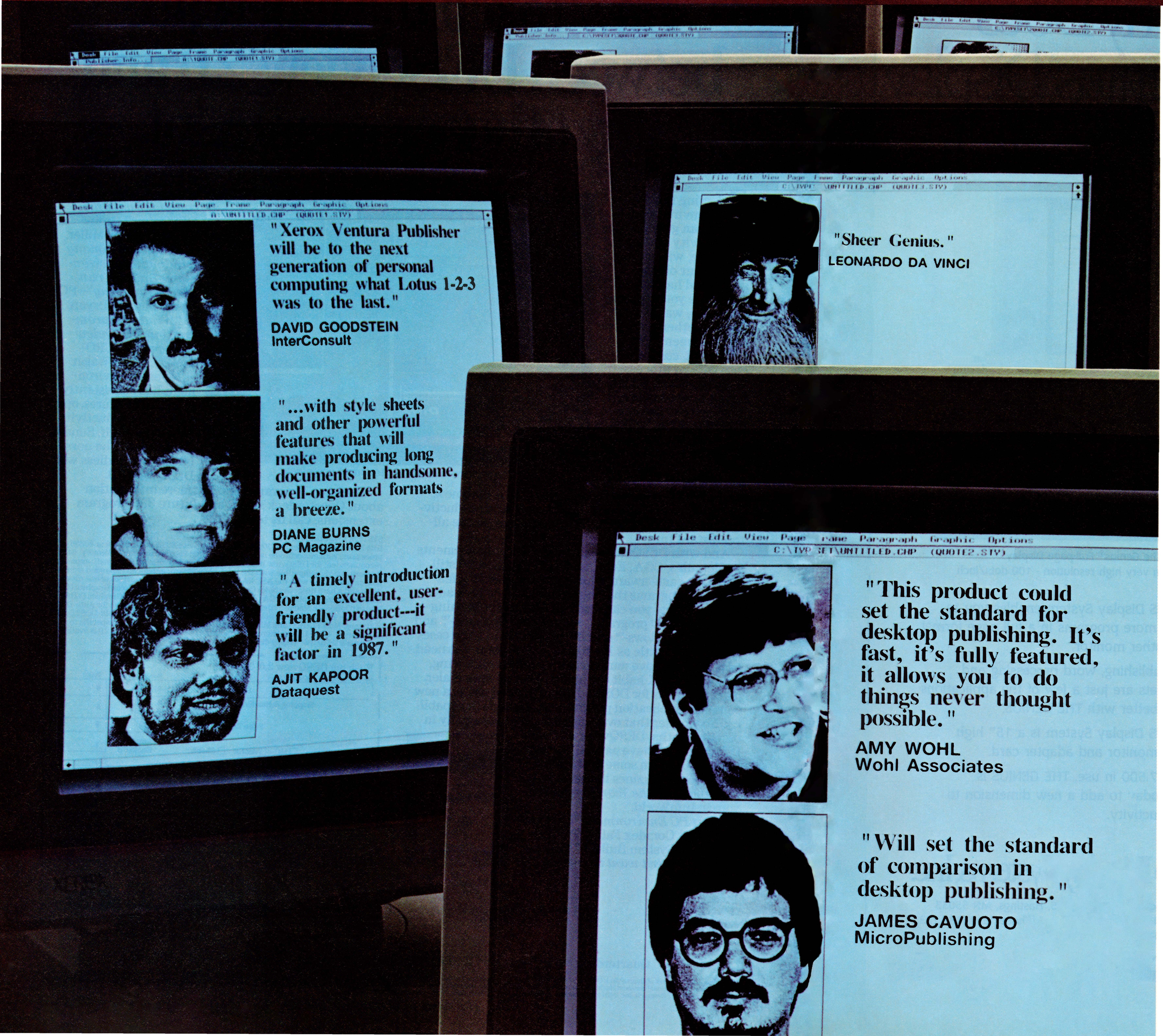

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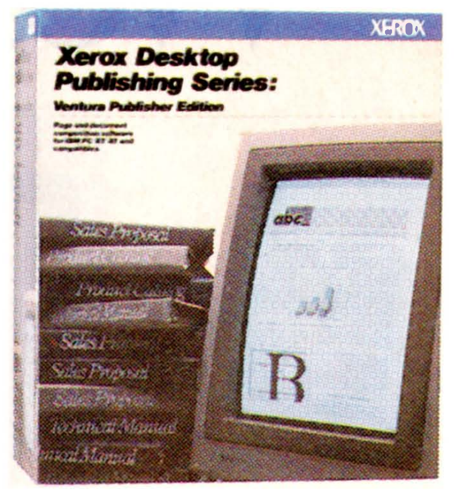

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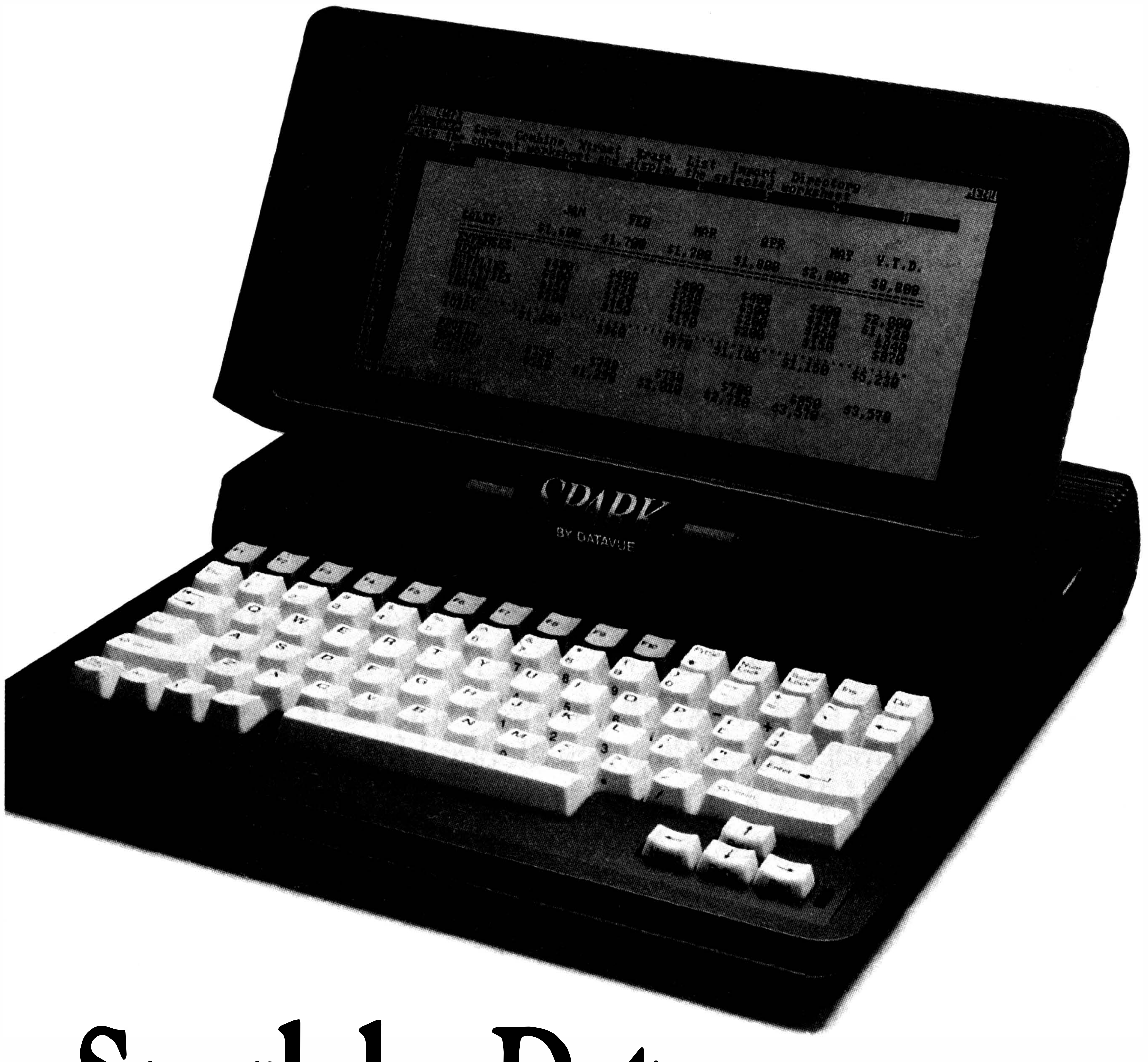

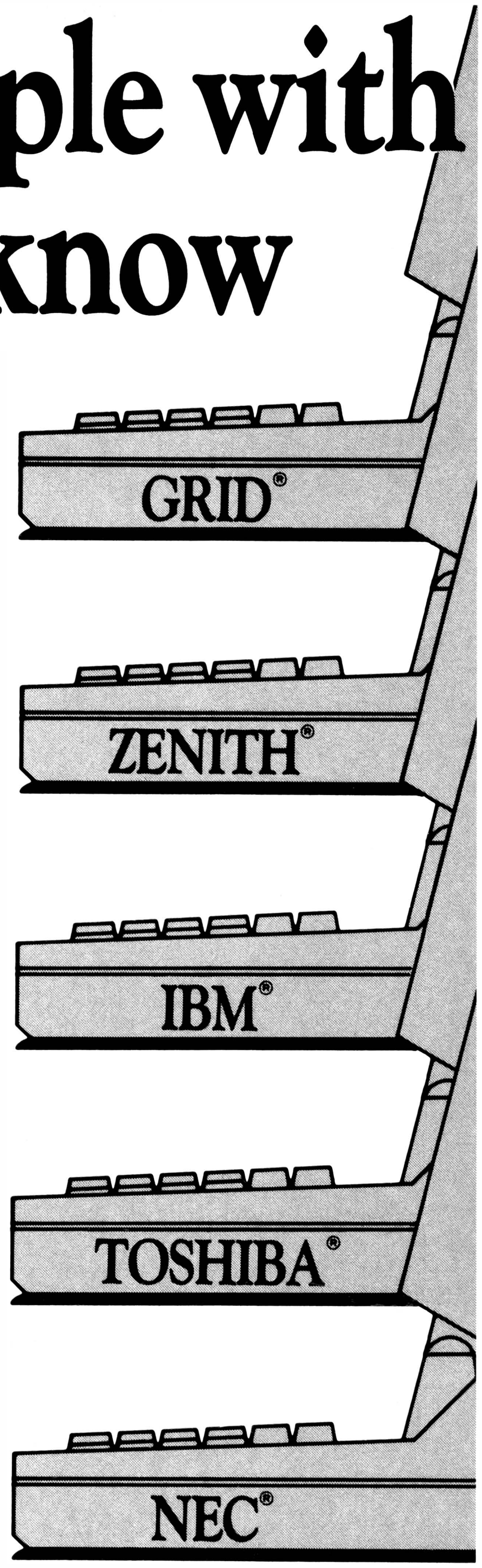

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PORTABLE COMPUTERS

As powerful as desktop computers, the smaller and lighter MS-DOS portables are making it easier to take your work home, on the road, or on an airplane. **by Stephanie Makrias**

You can take it with you when you go—without leaving behind power. Whether your job requires you to spend a lot of time on the road or to carry a computer home, a portable computer enables you to be as productive as you are at your desktop machine. Portables makers are listening to itinerant users' demands for desktop-level performance by including hard drives, faster processors, more memory, and far easier-to-read screens than appeared in early portables. A few companies are including so many features and expansion capabilities that one of their portables may be the only computer you need.

Back in the days of the first "laptop," the Tandy 100, people were limited to the notebook-style computer: diskless, very small displays, and built-in software that you had to use. Notebook

DAVID HAMSLEY

The Zenith Z-183 is a 15-pound laptop portable with a backlit, supertwist LCD screen and a 10Mb hard disk.

computers, like the improved Tandy 102, are available today, and may be suited for students or journalists. But for those who need to tote something with more muscle for business applications, the new breed of portable will do the job.

There are two classes of computer, both running on MS-DOS, covered in our guide: portables weighing less than 20 pounds that usually can run on batteries and fit in your briefcase; and transportables, which average about 30 pounds and require a wall outlet. The latter group lets you unplug your computer from your office outlet and plug it in again when you get home or, if you're away on a business trip, when you get to your hotel room. The former (when run on battery power) enables you to work at any location—airport lounge, plane, train, car, grassy knoll, kitchen table, or bed—for up to eight hours in some cases. A significant difference between the two is the fact that the transportables usually come with at least two industry standard expansion slots so you can, for example, increase memory. Laptop portables often have one or two proprietary slots, for modems or memory cards; some, such as the Toshiba and Grid Systems machines, can hook up to expansion units that hold as many as five standard cards. These expansion units cost up to $1,000, bringing the total price of the laptop over that of a comparably priced transportable.

Do portables cost as much as desktop computers? In most cases, they do. Miniaturizing all the bulk is an expensive proposition. Compaq's Portable III goes all the way up to $5,799 for the 40Mb hard disk version. But, the Portable III is unique, with far more features than most portables and a size and weight that, at 20 pounds, falls in between laptops and transportables. You can buy a portable on a smaller budget. Datavue offers an under-$1,000 laptop called the Spark, which has such notable features as a switchable 4.77- and 9.54MHz clock speed (an IBM AT runs at 8MHz) and 384k standard RAM, upgradable to 640k. Because there are so many low priced IBM desktop computer clones, though, you can often get more for your money with a desktop computer—except portability, of course. For example, the Nippon Electronic Technology NET V286 desktop computer costs $1,995 and includes: dual 6- and 10MHz clock speeds, 1Mb of RAM, two floppy disk drives, a 40Mb hard drive, six open expansion slots, a monochrome graphics adapter and mononchrome monitor, and parallel and serial ports. With a laptop of that price, the Zenith Z-171, for instance, you get a 14-pound 8088 (slower than an 80286), 4.77MHz machine with a backlit, supertwist LCD, 256k of RAM, two 5.25-inch floppy drives, and parallel and serial ports.

> **When battery power is about to run out, there's usually some sort of warning so you can save data in time.**

There is a further price consideration because of the U.S. Government's recent imposition of tariffs on selected Japanese-made products, including a 100 percent tariff on non-CRT-screen computers with a 16-bit data bus (those found in the V-30, 8086, and 80286 chips). Though the products affected—which include the NEC MultiSpeed, the Wang LapTop, and the Toshiba T3100—have not gone up in price yet (at press time), if inventories run out before the tariff is lifted, there may be price increases. Alternatively, the manufacturers might be forced to swallow all or part of the cost of the tariff, since doubling the price of the machines could render them unsaleable; change the configuration of the machines to avoid the tariff; or transfer manufacturing to the United States. Because most of the laptops listed here use an 8-bit bus (analogous to an 8-lane highway) to link the central processing unit to the other parts of the computer, the majority are unaffected by the tariff.

Most laptops come with 3.5-inch floppy disk drives. The smaller drives appear to be the wave of the future, since IBM's Personal System/2 machines all feature 3.5-inch drives. Nevertheless, the current standard among desktop machines is 5.25-inch drives. This isn't a problem if you use the portable as a stand-alone machine. Many popular programs are available in the smaller format, and you can hook your printer directly to the portable. If, however, you use your portable as a satellite of your desktop machine, you'll want to be able to transfer data back and forth. There are various methods with the different machines. The most straightforward way is to attach an external 5.25-inch drive, costing about $400 (and up) extra, to your portable. Not all offer this option. Similarly, you can install a 3.5-inch drive in a desktop machine.

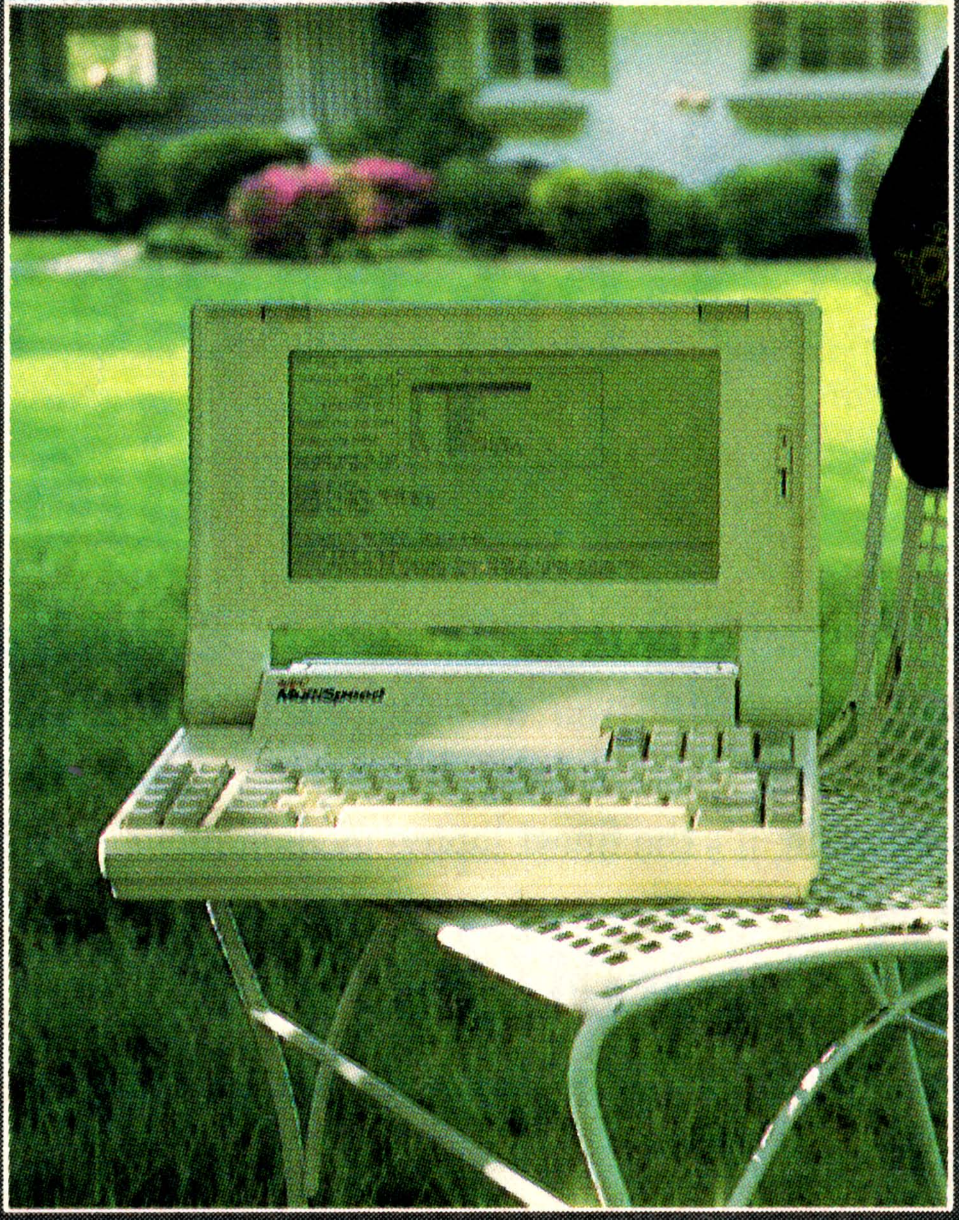
Another method is hooking the portable to a desktop computer, and using the larger computer's drives as if they were the portable's external drives. This is done with special cable kits offered by the manufacturer of the portable, as with NEC's external transfer kit ($99) for the MultiSpeed, or through a similar method involving the transfer of data with communications software and special "null modem" cables that hook up serial port to serial port. One portable maker, Toshiba, has a cable and software product called Floppy Link ($199) that competes against cable transfer products sold by third party vendors. They include White Crane Systems of Norcross, Ga., which has a transfer product called The Brooklyn Bridge ($129), and Traveling Software, a portable computer accessories company in Bothell, Wash., whose product is called Laplink. Finally, since modems are standard portable peripherals, you can send files over phone lines. For a sales person who needs to send a memo to the home office, a portable computer, modem, and electronic mail service or bulletin board are just the ticket.

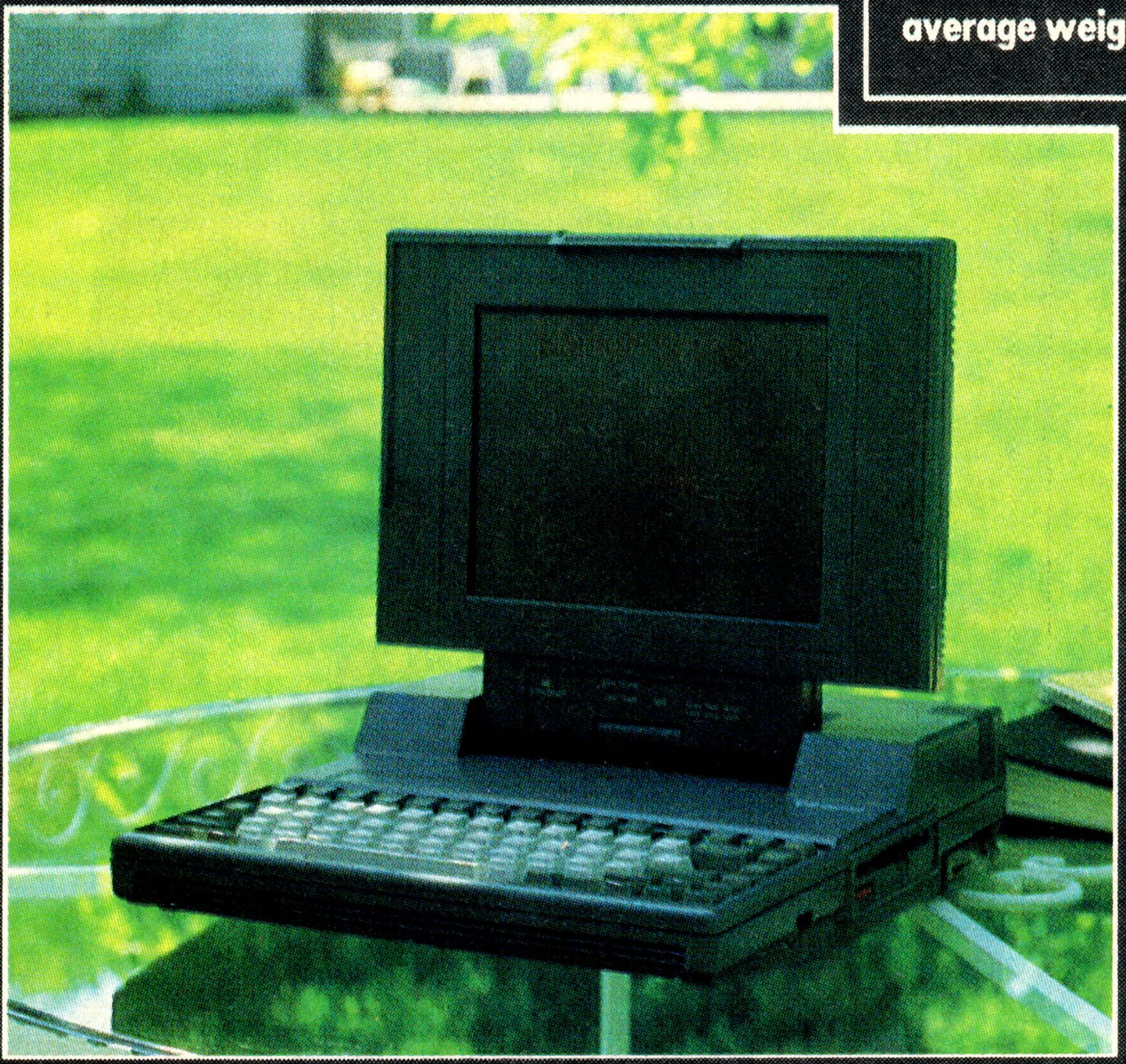
If the portable you want features 3.5-inch drives, you probably will not have trouble finding your favorite software in that format. Just about every portable computer listed here either comes standard with, or offers as an option, sufficient random access memory to run the same business programs available for desktop machines. The Kaypro 2000, for example, arrives with 768k as standard. Both Toshiba machines come with 640k, and the Bondwell-8 comes with 512k. As far as application incompatibilities with whatever version of DOS that comes with the portable, most companies we spoke to swore of no known problems, though several said they had a list of software they'd tested for compatibility. To be sure, it's best to check with your dealer to see if he has such a list from the manufacturer.

The Hewlett-Packard Portable Plus offers semi-compatibility: though it runs on MS-DOS 2.11, it cannot run IBM PC-compatible software. It instead runs ROM-based versions of popular programs such as Lotus 1-2-3 and MultiMate. You can read data from an IBM PC or compatible with an optional exter-

PORTABLES ON PARADE

Clockwise from upper left: the WANG LAPTOP with supertwist LCD screen and 10Mb hard disk; TOSHIBA T1100 PLUS with supertwist LCD screen and twin 3.5-inch floppy drives; NEC MULTISPEED with supertwist LCD screen and dual 3.5-inch floppy drives; DATAVUE SPARK with supertwist LCD screen and one 3.5-inch floppy drive; TOSHIBA T3100 with plasma screen, 10Mb hard disk, and 3.5-inch floppy drive; IBM PC CONVERTIBLE with supertwist LCD and two 3.5-inch floppy drives. The average weight is 12 pounds.





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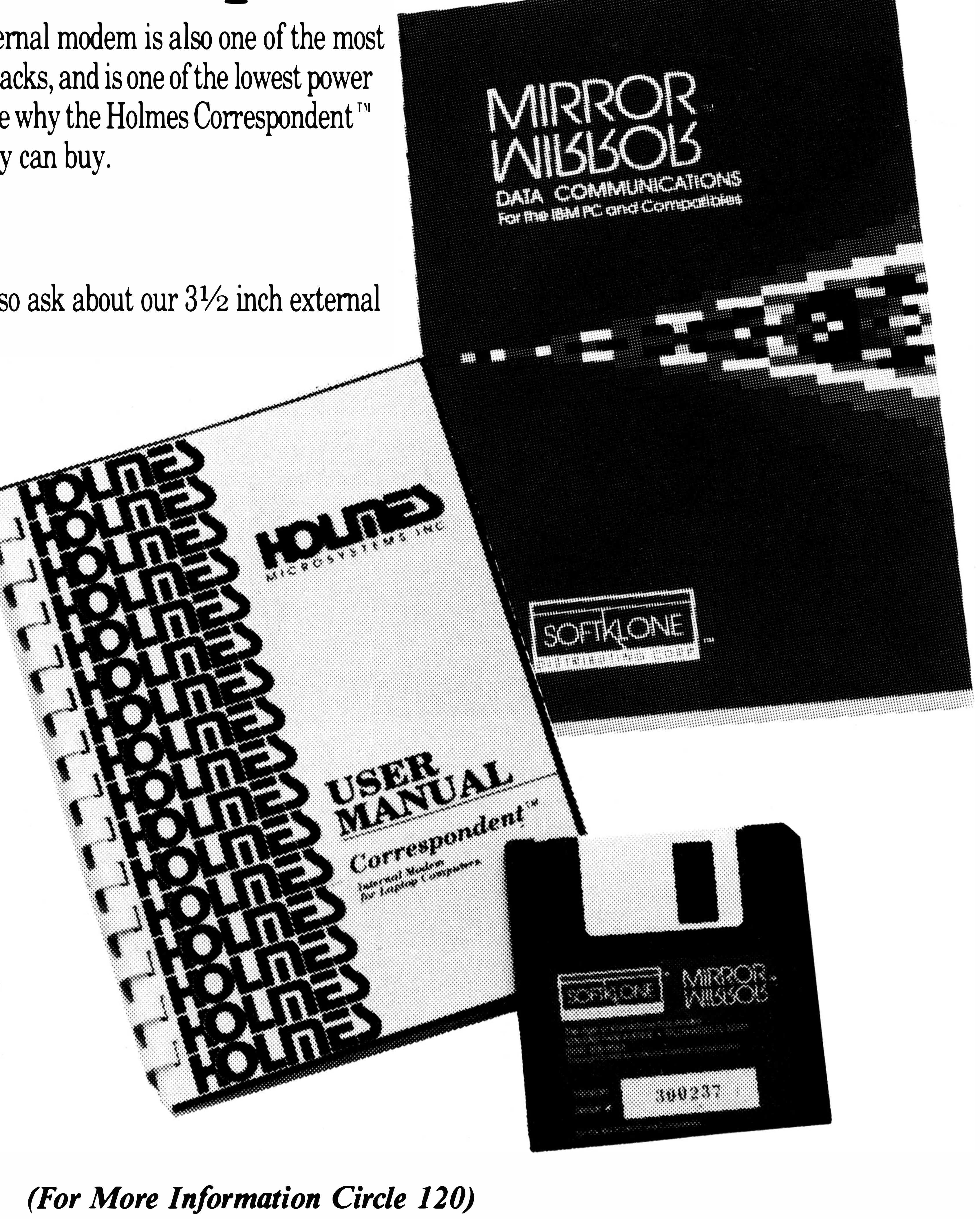
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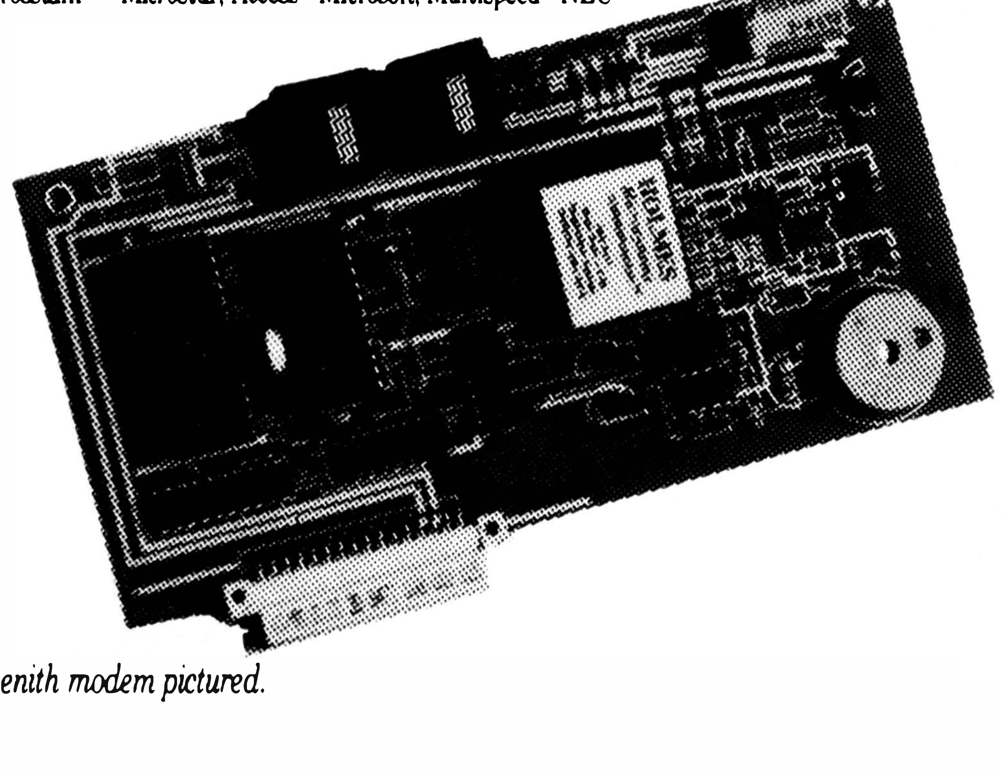

Zenith modem pictured.

(For More Information Circle 120)

nal drive. This computer is compatible with HP's proprietary office automation equipment. The Wang LapTop, on the other hand, is fully compatible with both the Wang environment and IBM's. It even allows you to integrate IBM programs on its Wang menu of applications.

As you shop around for a portable, you're going to come across a variety of flat-screen displays that have all sorts of names. The best way to evaluate a portable's display is to let your own eyes be the judge. Look at it in bright light. Look at it in dim light. Look at it from different angles. Consider the shape of the screen; the Zenith 181 and 183, and the Data General One/Model 2 have full-size 80-column by 25-line screens, while others have more rectangular screens that will slightly squash a round pie chart. To demonstrate something vital on the screen to groups of people, you need a sharp display that can be read from all angles. But if the portable's screen will be seen by your eyes only, you may not need a more expensive screen. The condition of the lighting in the place you will be most often working is another consideration.

As a guideline, there are basically three types of displays: liquid crystal display (LCD) and two higher-quality displays—electroluminescent (EL), and gas plasma display. Liquid crystal displays can be enhanced with supertwist technology and/or backlighting. Supertwist screens are found on Toshiba's T1100 Plus and IBM's PC Convertible, among others. Most portables feature LCDs. Some have the better quality, more power consuming, more expensive gas plasma. And the Data General One/Model 2 uses an EL screen, which again is supersharp, power-hungry, and expensive. All of the Datavue portables use LCDs with different types of backlighting. The company uses confusing terminology in describing one of its optional LCDs as backlit with an EL panel, and another as "gaslight"—resembling a gas plasma, but actually a fluorescent backlit LCD with a special amber filter.

Liquid crystal displays do not emit their own light. They rely entirely on reflected light. So, if you're sitting in the dark in the back of a taxi cab, you won't be able to read the screen at all. Most LCDs are quite acceptable in a well lit room when viewed at the proper angle. Don't jump to the conclusion that all LCDs are hard to read. If you've seen one, you haven't seen them all. They do differ in quality. Screens employing supertwist technology will show a better contrast between the characters and the background. Many LCDs also offer improved quality through backlighting. Backlit LCDs can be read under poor lighting conditions. The characters in EL screens and gas plasma screens, on the other hand, actually emit their own light and are a lot clearer than LCDs. The drawback to the superior screens is that they will either eliminate, as with the Toshiba T3100, or greatly lessen, as with the GridCase 3 Plus, battery life because of the large amount of power they draw to operate. The Datavue gaslight screen, because it is actually an LCD, looks comparable to a gas plasma display but doesn't use as much power.

A hard disk will also use more power, so the battery doesn't last as long between recharges. The NiCad internal battery featured in many portables is usually recharged automatically when the computer is plugged in; recharging time averages eight hours. (Several companies offer recharging devices that will cut the time in half.) Some portable companies don't offer a battery at all, such as Sharp. As of May, Toshiba didn't offer a battery for the T3100, but another company, Product R&D Corp. of San Luis Obispo, Calif., makes a 12-volt battery called Adaptapak for the T3100. It weighs 7 pounds and is priced at $399. R&D also offers the $299 Adapta-80, which weighs one pound and enables you to plug the T3100 into a car cigarette lighter. Though the T3100's display drains the Adaptapak's charge in about an hour, other hard disk portables, like the Datavue 25, will run for three hours with an external battery. The GridCase 2 Plus, which has a supertwist LCD, is said to run four hours on battery power with its optional 10Mb hard disk. The GridCase 3 Plus, which has a gas plasma screen, will run one hour with the hard disk. Datavue's

Airlines Zigzag On In-Seat Computing

Passengers calling airlines about using a portable computer in flight are likely to get the runaround. Personnel for the same airline contradict each other. Some say it depends on the display. One carrier had to telex Europe for clarification. Another suggested that you'd probably need to fly first class in order to have the room. One said that flying with a computer sounded similar to patients traveling with medical equipment—if you request it ahead of time, the crew will provide you with an outlet. Most simply transfer you to someone they think can help you.

Much of the confusion is due to the fact that computing was once banned by commercial airlines. It wasn't until 1984 that the Federal Aviation Administration released a study showing that lap portables did not interfere with an airplane's navigation and communication equipment.

Even so, JAL (Japan Air Lines) still says the decision depends on the computer's display screen. "LCDs are OK," says Morris Simoncelli, director of public relations. "The ones with the reddish glow aren't," he says, referring to plasma screens on some of the more expensive portables. "There's concern about how they could affect the navigation system. One of our routes between Alaska and Japan is 50 miles east of Russian air space."

According to Thomas Tripp, manager of technical information for the Air Transport Association, the airlines' Washington-based trade group, there is no industry policy banning in-flight computing. "The only restriction is the same that applies to all carry-on baggage. It has to fit in the overhead compartment or under the seat in front of you, and you can't be using it during takeoff and landing."

Though Tripp suggests that you call ahead, people who regularly compute on planes say that they usually wait until they're aboard, and only then ask a flight attendant if it's OK to ply the keyboard.

Several airborne computer users we interviewed say they prefer an aisle seat, where there is more room to spill over the armrest, and they can avoid glare from a window.

As for walking through the airport security gate before boarding, passengers said they handed their computers and disks to attendants rather than run them through metal detectors and X-ray equipment, because they feared they'd lose valuable data. Responds Tripp: "Everyone has the option of a hand search, but, frankly, the magnetic field is at a very low level. The chances of wiping out data are about the same as clouding film. It doesn't happen."

—Michael Antonoff

Snap 1+1 should run for five hours on the battery with its 20Mb hard disk. The Wang LapTop features a 10Mb hard disk and four-hour consecutive battery use. These are average times; the intensity of your computing—conditions like how much disk access is involved—will alter them. If you're stuck in an airport, perhaps, and you want to keep on working after your battery's drained, you can (in some instances) easily remove the old NiCad and insert a new one.

Computing on battery power usually features some sort of warning to alert you when the battery is about to run out. This way, you can save data in time.

The central processing units in most of the portables use CMOS—the "C" in 80C86 or 80C88—chips. Because they draw less power than regular 8086 or 8088 chips, they make it possible for a portable to run on a smaller, lighter weight battery than would otherwise be necessary. Clock speeds are about the same as desktop computers, ranging between 4.77- and 9.54MHz. The Toshiba T3100 and the Grid 286 (which are essentially the same machine) both have 80286, 4- and 8MHz clock speed CPUs. The Compaq Portable III includes an 80286 CPU running at 8- and 12MHz.

The weight of a portable will increase as you load it up; installing a hard disk, for example, adds two to four pounds. An AC adapter can also add a few pounds in your carrying case. If you are interested in a portable printer, Diconix, Inc., of Dayton, Ohio, sells its ink jet Diconix 150 for $479, which will add four more pounds to your burden. Sharp offers its own thermal printer for $449, weighing 10 pounds. The Wang LapTop has a built-in thermal printer; the entire unit weighs a little over 14 pounds. Nylon carrying cases are sometimes included in the price of the portable; others offer them for an extra $50 to $100.

The Panasonic Exec. Partner is the only transportable with a built-in thermal printer. This unit weighs 30 pounds and has a plasma display rather than a CRT. Standard expansion slots, built-in CRT monitors, and 5.25-inch floppy drives are what usually attract people to transportables instead of portables. Sanyo's MBC 775 even has a built-in color monitor. Also, transportables have keyboards that are just about standard size, with a standard key layout. Portables' smaller keyboards vary just as much as their displays do. Some gracefully fit function keys and separate numeric keypads; some fit them awkwardly. With some keyboards, the keypad is overlaid. In any case, your portable's keyboard is not going to look or feel like the XT or AT style you may be accustomed to. Portable manufacturers understand that some people don't like to change from desktop computers, so some offer the option of plugging in XT- or AT-style keyboards.

Users who are plugged in and stationary for a time also can hook up a more pleasant and familiar display—CGA is almost universally supported among portables. The Snap 1+1 will even support an EGA half-size card and monitor. This is a nice feature for those who use graphics programs requiring EGA. Displaying graphics on a typical laptop is certainly possible, but it's not as sharp as on a monochrome or color external monitor.

It's clear when talking about display that it may not be possible to get every last benefit of a desktop computer with a diminutively sized machine. But in most other respects, the portables are coming closer and closer in features and options to provide the efficiency that power users need—at their desks, or anywhere.

Macs To Go

While users of IBM-compatible products have a wide array of lightweight portables to choose from, Apple Macintosh users are not so fortunate. Apple Computer has always called the Mac a "portable," though most people would consider it a transportable. The Macintosh does have a handle, and a carrying case is available.

Because Apple Macintosh architecture can't be cloned legally, no laptop Macs have been made by other manufacturers. Now, having reached an arrangement with Apple Computer, at least two companies, Dynamac and Colby Systems Corp., are coming out with truly portable Macs.

Both companies sell their Macs at a retail price starting at $4,995. The high cost is partly due to the fact that these companies can't manufacture all of the product themselves, but must purchase actual Mac Plus computers and reconfigure them into portables. (Dynamac has a VAR [value added reseller] agreement with Apple that allows it to purchase the Macs at a discount.)

The Dynamac offers an electroluminescent screen.

Colby Systems has already shipped 150 Lap-Macs to the federal government. Dynamac hopes to receive FCC approval in June. The units weigh about 16 pounds, not much less than a Mac Plus, which weighs 16.8 pounds. But the units are slim; the Dynamac is 3.5-inches high, 13.75-inches wide and 16-inches deep; the Lap-Mac 3- by 14- by 18-inches.

The Dynamac (which is the name of the computer as well as the company) has a 640- by 400-pixel-resolution, electroluminescent screen. It comes with 1Mb of RAM, one 800k floppy drive, a mouse, a SCSI (small computer systems interface), an external disk drive, and two serial ports. Options include a 20Mb hard disk, $849; 40Mb hard disk; $1,495, internal modem, $295; and up to 3Mb of RAM. A four-pound ink jet printer is available. Dynamac Computer can be reached at 1536 Cole Blvd., Suite 252, Golden, CO 80401; (303) 233-0305.

Colby System's Lap-Mac comes with a gas plasma screen (an LCD is optional). Otherwise, it has the same standard features as the Dynamac, and it can be upgraded to 4Mb of RAM. Lap-Mac options include a 20Mb hard disk for $1,295; 40Mb, $1,995; and up to a 100Mb for $2,995. Colby Systems Corp. is at 4723 North Warren Ave., Fresno, CA 93705; (209) 222-4985.

—S.M.

PORTABLE COMPUTERS

The following chart lists portable personal computers weighing 20 pounds or less. Among the features detailed are the machines' price; the dimensions for the weight; height, width, and depth in inches; the type of flat panel screen; the number and type of drives and the standard and optional special features.

COMPANY/*Model*	PRICE	WEIGHT (lbs.)	SIZE (HxWxD)	SCREEN	DRIVES	CPU/CLOCK SPEED (MHz)	SPECIAL FEATURES
Bondwell *Bondwell-8*	$1,295	10	3.1×12.2×11.2	b, st LCD	3.5-in. FD	80C88/4.77	Inc.: 8-hour battery, 512k, S, P, RGB, composite, and ext. drive ports, 300-baud modem, telecommunications, RAM disk, GW Basic 2.0, and MS-DOS 2.11 software, low battery warning light. Opt.: ext. 3.5-in. FD, $400; ext. 5.25-in. 360k FD, $380.
Compaq *Portable III Model 1*	$3,999	18	9.8×16×7.8	plasma	1.2Mb 5.25-in. FD	80286/8- & 12	Inc.: 640k, S, P, and RGB ports, numeric keypad. Opt.: 360k 5.25-in. FD, $225; expansion unit (with two slots), $199; memory expansion board, $225; 512k upgrade, $250; 2Mb upgrade, $1,299; modem, $399; 80287 math coprocessor, $349; DOS 3.2, $95.
Model 20	$4,999	20	Same as Model 1	Same	1.2Mb 5.25-in. FD and 20Mb HD	80286/8- & 12	Inc.: 640k, S, P, and RGB ports, numeric keypad. Opt.: 360k 5.25-in. FD, $225; expansion unit (with two slots), $199; memory expansion board, $225; 512k upgrade, $250; 2Mb upgrade, $1,299; modem, $399; 80287 math coprocessor, $349; DOS 3.2, $95.
Model 40	$5,799	20	Same as Model 1	Same	1.2Mb 5.25-in. FD and 40Mb HD	80286/8- & 12	Inc.: 640k, S, P, and RGB ports, numeric keypad. Opt.: 360k 5.25-in. FD, $225; expansion unit (with two slots), $199; memory expansion board, $225; 512k upgrade, $250; 2Mb upgrade, $1,299; modem, $399; 80287 math coprocessor, $349; DOS 3.2, $95.
Data General *DG One/Model 2T*	$1,695	11	14.5×12×3	b, st LCD	3.5-in. FD	80C88/4.77 & 7.16	Inc.: 5-hour battery, 512k, S and P ports, MS-DOS 3.2. Opt: base plus two 3.5-in. FDs, $1,895; base plus 10Mb HD, $2,895; base plus EL screen, $2,695; EL screen and two 3.5-in. FDs, $2,895; EL screen, 3.5-in. FD, and 10Mb HD, $3,895; 768k RAM, $200; 1Mb RAM, $495; 2Mb RAM, $895; ext. 3.5-in. FD, $300; RGB adapter, $245; numeric keypad, $125; modem, $400; 5.25-in. ext. FD, $799; PC connector, $180; ink jet printer, $525; quick charger, $95; case, $99.
Datavue Corp. *Datavue 25*	$1,695	12	10.5×12.75×6.25	fl, b LCD, or LCD	360k 5.25-in. FD	80C88/4.77	Inc: 2-hour battery, 256k, S, P, RGB, composite, and ext. drive ports, MS-DOS 2.11, numeric keypad, low battery warning light. Opt. config.'s: base plus fl, b "gaslight" screen, $1,945; fl, b LCD plus two 3.5 FDs, $1,695; gaslight screen plus one 3.5-in. FD and one 20Mb HD, $3,195; gaslight screen plus two 3.5-in. FDs, $2,045; ext. 5.25-in FD, $349; int. modem, $495; case, $50; auto adapter, $150. 768k RAM upgrade, $300; 1.25-Mb RAM upgrade, $500.
Spark	$995	9	2.5×13.2×13	st LCD	3.5-in. FD	V20/4.77 & 9.54	Inc.: 8-hour battery, 384k, S, P, RGB, composite, and ext. drive ports, MS-DOS 2.11, low battery warning light. Opt: base plus st, b, EL screen, $1,120; base plus two 3.5-in FDs, $1,195; EL screen plus two 3.5-in. FDs, $1,320; int. modem, $325; ext. 5.25-in. FD, 640k, $130.
Snap 1+1	$2,095	10	3.5×13×13	st LCD	two 3.5-in. FDs	80C88/4.77	Inc.: 5-hour battery, 640k, S, P, RGB, composite, and external drive ports, one half-size exp. slot, numeric keypad, MS-DOS 2.11, low battery warning light. Opt: base plus 3.5-in. FD and 20Mb HD, $3,495; st, b, EL screen, $400; gaslight screen, $500; 5.25-in. FD, $300; int. modem, $325; case, $75.

b-backlit, CC-clock/calendar, EL-electroluminescent, EMS-extended memory specification, exp.-expansion, ext.-external, FD-floppy disk, fl-fluorescent, GP-game port, HD-hard disk, in.-inch, Inc.-included, k-kilobytes, LCD-liquid crystal display, MHz-megahertz, Opt.-optional, P-parallel, prop.-proprietary, RF-radio frequency, RGB-red, green, blue, S-serial, SCSI-small computer systems interface, st-supertwist, W-watts

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COMPANY/*Model*	PRICE	WEIGHT (lbs.)	SIZE (HxWxD)	SCREEN	DRIVES	CPU/CLOCK SPEED (MHz)	SPECIAL FEATURES
Grid Systems							
GridLite	$1,750	8.5	11×13×2	st LCD	3.5-in. FD	80C86/4.77	Inc.: 3-hour battery, 128k, S, P, RBG, and keyboard ports. Opt: ext. 3.5-in. FD,$295; PC S to S connector, $60; modem, $495; 640k RAM upgrade, $600; 1Mb EMS RAM, $395.
GridCase 2 Plus	$2,750	11.5	2×11×15	st LCD	3.5-in. FD	80C86/4.77	Inc.: 4-hour battery, 128k, S, P, and keyboard ports, 8087 coprocessor socket, case, low battery warning light. Opt: base plus 10Mb HD, $975; 3.5-in. ext. FD, $295; ext. 5.25-in. FD, $895; ext. 10Mb HD, $1,450; PC connector, $60; modem, $495; RGB port, $295; 640k RAM upgrade, $600; 512k RAM upgrade, $400; exp. chassis, $325; adapter for autos, $25; power supply options available.
GridCase 3 Plus	$3,280	11.5	2×11×15	plasma	3.5-in. FD	80C86/4.77	Inc.: 1.5-hour battery, 128k, S, P, and keyboard ports, 8087 coprocessor socket, case, low battery warning light. Opt: base plus 10Mb HD, $975; 3.5-in. ext. FD, $295; ext. 5.25-in. FD, $895; ext. 10Mb HD, $1,450; PC connector, $60; modem, $495; RGB port, $295; 640k RAM upgrade, $600; 512k RAM upgrade, $400; exp. chassis, $325; adapter for autos, $25; power supply options available.
Grid 286	$3,850	15	3.1×12.2×14.2	plasma	3.5-in. FD & 10Mb HD	80286/4 & 8	Inc.: 640k, S, P, RBG, and ext. drive ports, slot for memory exp., case. Opt: 5.25-in. ext. FD, $495; desktop connector, $60; modem, $495; exp. chassis, $1,195; MS-DOS, $150; numeric keypad, $100; adapter for autos, $25.
Hewlett-Packard							
Portable Plus	$2,995	9	3×13×10	st LCD	0	80C86/5.33	Inc.: 20-hour battery, 512k, S, Hewlett-Packard-Interface Loop, and RGB ports, 12 ROM software cartridge slots, slot for 128k RAM upgrade, MS-DOS 2.11, low battery warning light. Opt.: base plus modem, $3,490; 10Mb HD, $1,690; 20Mb HD, $1,940; desktop connector, $150. Note: only PC data—not program—compatible.
IBM							
PC Convertible	$1,695	12.2	2.7×12.3×14.7	st LCD	two 3.5-in. FDs	80C88/4.77	Inc.: 6-hour battery, 256k, two memory exp. slots, low battery beep. Opt: display adapter $255; S/P adapter, $80; 128k memory card, $160; 345k memory card, $345, modem, $450; printer, $295.
Kaypro Corp.							
Kaypro 2000	$1,595	11.5	2.75×11.5×12.75	LCD	3.5-in. FD	8088/4.77	Inc.: 4-hour battery, 784k, S port, WordStar, CorrectStar, MailMerge, Star Index, HollyWindows, KDesk, GW Basic, MS-DOS 3.1 software, case. Opt: 3.5-in. FD, $295; ext. 5.25-in. FD, $295; expansion chassis, $795; modem, $250; S to P interface, $65; null modem cable, $50; multi-adapter, $155; ext. battery pack, $45.
NEC							
MultiSpeed	$1,995	11.2	3.1×13.6×12.4	st LCD	two 3.5-in. FDs	V30/4.77 & 9.54	Inc: 4-hour battery, 640k, S, P, RGB, phone, and data transfer ports; Telecom, Outliner, Filer, Notepad, and Dialer ROM software, MS-DOS 3.2; slot for modem, numeric keypad, low battery warning light. Opt: modem, $399; desktop connector, $129; external transfer kit, $99; battery pack, $99.

b-backlit, CC-clock/calendar, EL-electroluminescent, EMS-extended memory specification, exp.-expansion, ext.-external, FD-floppy disk, fl-fluorescent, GP-game port, HD-hard disk, in.-inch, Inc.-included, k-kilobytes, LCD-liquid crystal display, MHz-megahertz, Opt.-optional, P-parallel, prop.-proprietary, RF-radio frequency, RGB-red, green, blue, S-serial, SCSI-small computer systems interface, st-supertwist, W-watts

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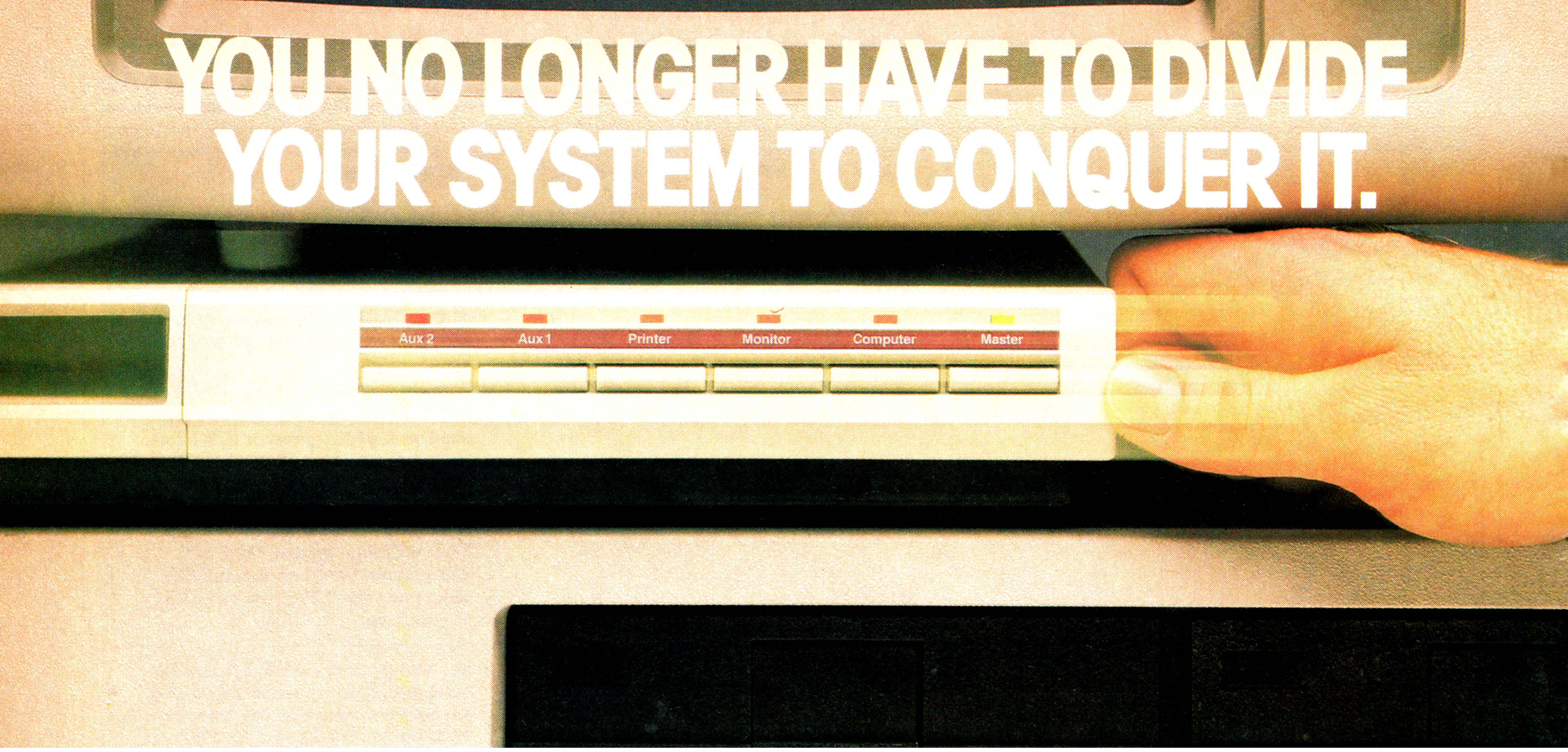

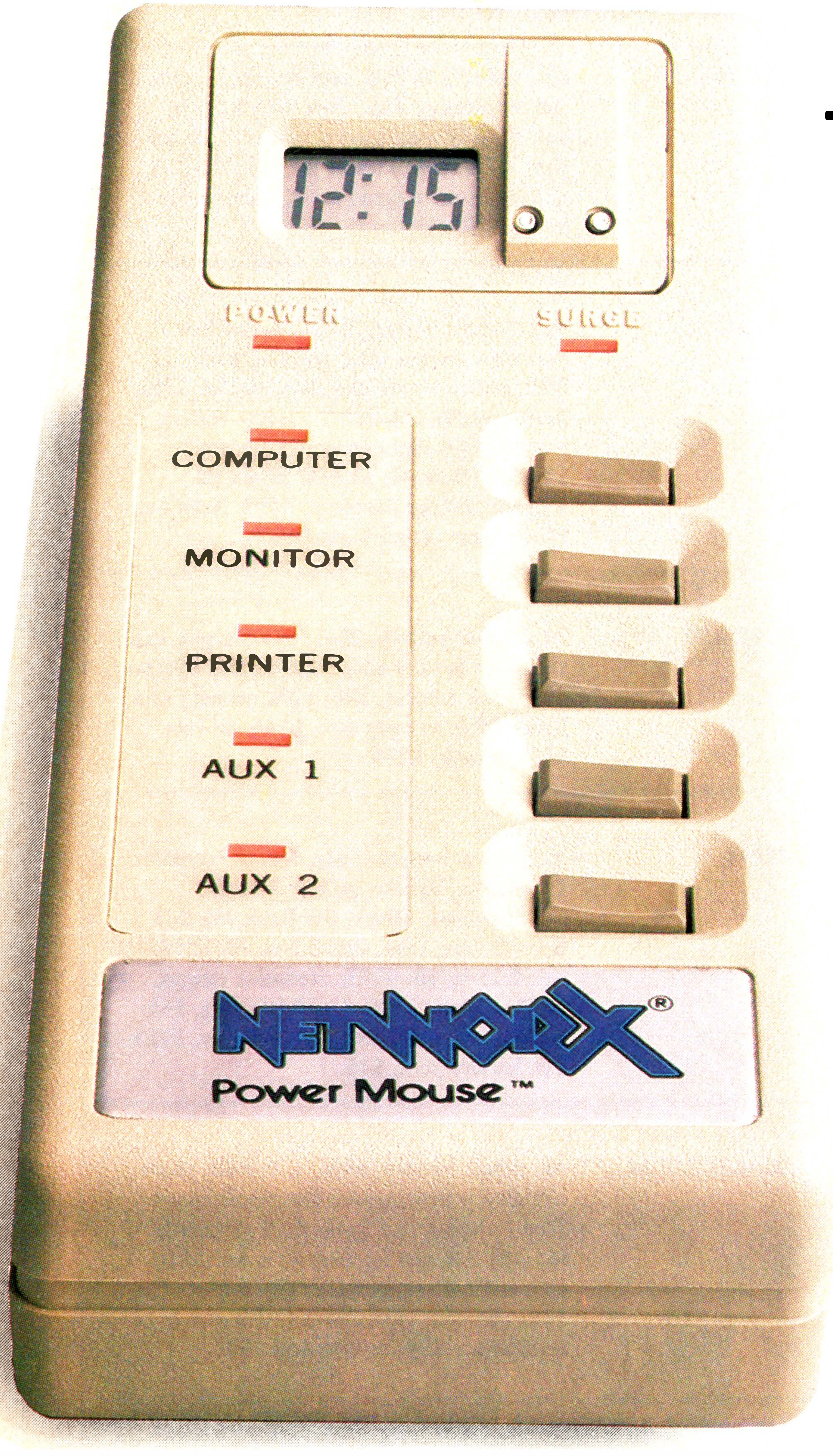

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A one-touch system controller used to mean a bulky contraption that came between your monitor and computer. And that meant raising your monitor higher than its intended eye-level. And that meant eyestrain. Headaches. And a very real pain in the neck. Not to mention the inconvenience of rearranging your workstation.

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COMPANY/*Model*	PRICE	WEIGHT (lbs.)	SIZE (HxWxD)	SCREEN	DRIVES	CPU/CLOCK SPEED (MHz)	SPECIAL FEATURES
Sharp *PC7000A*	$1,795	17.5	8.5×16×6.3	b, st LCD	two 5.25-in. FDs	80C86/4.77 & 7.37	Inc.: 320k, S and P ports, two prop. slots, MS-DOS 2.11, numeric keypad. Opt: ext. 20Mb HD, $1,395; exp. unit, $400; 128k RAM upgrade (up to 720k), $79; CGA, $285; modem, $369; case, $85; thermal printer, $449.
PC7100	$2,795	19	8.5×16×6.3	b, st LCD	5.25-in. FD & 20Mb HD	80C86/4.77 & 7.37	Inc.: 320k, S and P ports, two prop. slots, MS-DOS 2.11, numeric keypad. Opt: ext. 20Mb HD, $1,395; exp. unit, $400; 128k RAM upgrade (up to 720k), $79; CGA, $285; modem, $369; case, $85; thermal printer, $449.
Toshiba America *T1100 Plus*	$2,095	10	2.6×12.2×12	st LCD	two 3.5-in. FDs	80C86/7.16 & 4.77	Inc.: 4-hour battery, 640k, S, P, RGB, and composite ports, SideKick and MS-DOS 3.2 software, case, low battery warning light. Opt: ext. 5.25-in. FD, $499; exp. chassis, $999; desktop connector, $199; modem, $399; auto adapter, $39.
T3100	$4,199	15	3.1×12.2×14.2	plasma	3.5-in. FD & 10Mb HD	80286/4 & 8	Inc.: 640k, S, P, RGB, and composite ports, SideKick and MS-DOS 3.2 software, case. Opt.: ext. 5.25-in. FD, $499; exp chassis, $999; desktop connector, $199; modem, $399.
Wang *LapTop*	$3,530	14.25	4×13×11.9	st LCD	10Mb HD	V30/8	Inc.: thermal printer, 4-hour battery, 512k, S, RGB, SCSI, and telephone ports, two slots, MS-DOS 3.2, case. Opt: ext. 5.25-in. FD, $365; ext. 3.5-in. FD, $518; 512k RAM upgrade, $695; S to P adapter, $130; modem, $425, numeric keypad, $95.
Zenith *Z-171*	$1,999	14.3	9.5×13×6.6	b, st LCD	two 5.25-in. FDs	80C88/4.77	Inc.: 3-hour battery, 256k, S, P, and RGB ports; Calculator, Phone Directory, Calendar, Communications, and MS-DOS 3.2 software; low battery warning light. Opt: 256k RAM upgrade (up to 640k) $80; video card, $229; modem, $379; case, $69.
Z-181	$2,399	11.8	3.1×13.4×11.6	b, st LCD	two 3.5-in. FDs	80C88/4.77 and 8	Inc.: 5-hour battery, 640k, S, P, RGB, and ext. drive ports, MS-DOS 3.2, low battery warning light. Opt: ext. 20Mb HD (AC-operated only), $1,299; ext. 5.25-in. FD, $399; desktop connector, $99; modem, $399; case, $89; auto adapter, $19.
Z-183	$3,499	15	3.45×13.4×13.9	b, st LCD	3.5-in. FD and 10Mb	80C88/4.77 & 8	Inc.: 3-hour battery, 640k, S, P, RGB and ext. drive ports, MS-DOS 3.2, low battery warning light. Opt.: ext. 5.25-in. FD, $399; desktop connector, $99; modem, $399; case $89; auto adapter, $19.

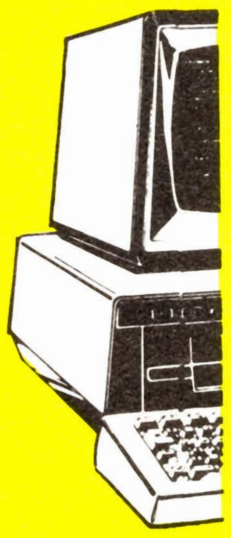
TRANSPORTABLE COMPUTERS

The following chart lists transportable computers weighing more than 20 pounds. Among the features detailed are the machines' price; the dimensions for the weight; height, width, and depth in inches; the basic configuration included at the price; and all the standard and options available, with prices.

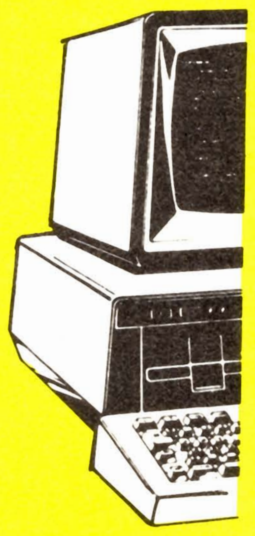
COMPANY/*Model*	PRICE	WEIGHT (lbs.)	SIZE (HxWxD)	CONFIGURATION	OPTIONS
Chicago Comp. Conn *CCC Portable XTC*	$999	28	7.5x19x16.5	8088-2, 4.77- and 8MHz, 256k, two 360k FDs, P port, seven slots (five open), 9-in. monitor, monochrome or composite color card, 135 W, XT-style keyboard.	Base plus 360k FD and 20Mb HD, $1,300; base (two FDs) plus 20Mb HD, $1,378; monochrome or composite color card, $69; 1.2Mb FD, $179; 640k upgrade, $59; MF card w/ S and P ports, CC and GP, $99.

b-backlit, CC-clock/calendar, EL-electroluminescent, EMS-extended memory specification, exp.-expansion, ext.-external, FD-floppy disk, fl-fluorescent, GP-game port, HD-hard disk, in.-inch, Inc.-included, k-kilobytes, LCD-liquid crystal display, MHz-megahertz, Opt.-optional, P-parallel, prop.-proprietary, RF-radio frequency, RGB-red, green, blue, S-serial, SCSI-small computer systems interface, st-supertwist, W-watts

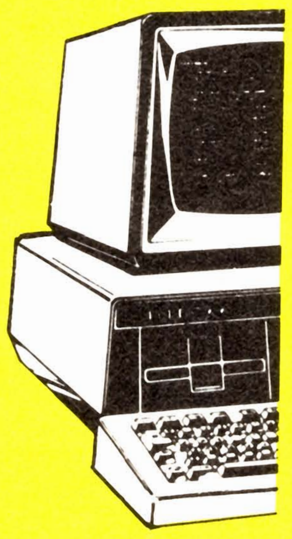
How much computer will $799 buy?



About this much of an IBM PC XT



About this much of a COMPAQ



About this much of a LEADING EDGE

About this much of an EPSON

With the AMSTRAD PC1512, everything is included.

At last! A powerful IBM-compatible personal computer with the popular "MOUSE" and software, all at an affordable price. No add-ons needed, just plug it in and go!

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Monochrome monitor, paper white with 16 gray levels – 360kb double sided floppy disk drive – 512k memory – 8086 processor (8mhz) – "mouse" – PC compatible keyboard – Joystick port – Parallel and Serial ports – 3 full sized PC compatible expansion slots – Complete user instructions.

"FREE" Software ($500 retail value)

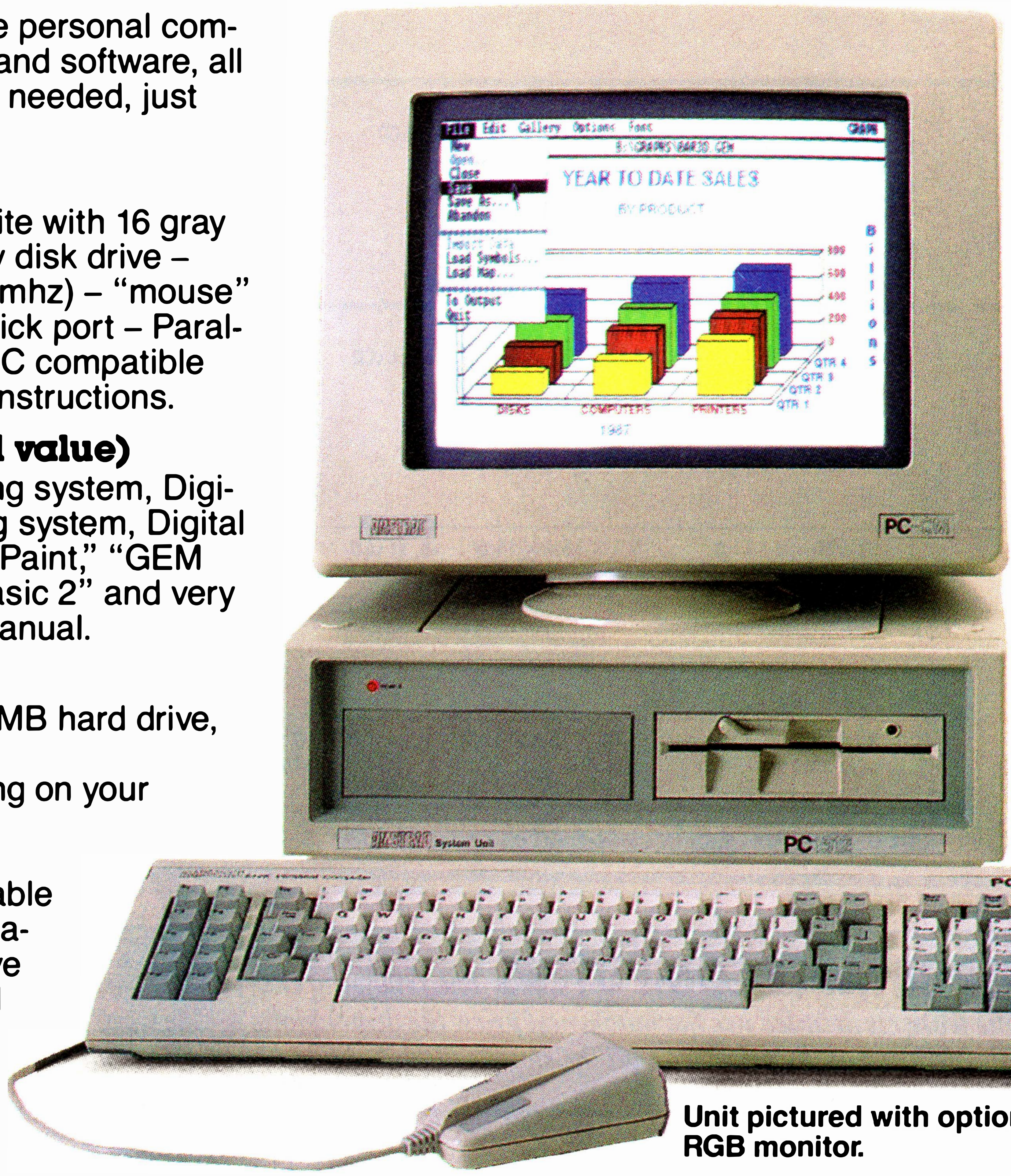
Microsoft MSDOS V3.2 operating system, Digital Research DOS PLUS operating system, Digital Research "GEM Desktop," "GEM Paint," "GEM Doodle," Locomotive Software "Basic 2" and very detailed, clearly presented user manual.

Optional Features

Second Floppy disk drive or 20 MB hard drive, RGB Color Monitor, 16 colors.

It's never been easier to get going on your own personal computer. It's what you've been waiting for.

The AMSTRAD PC1512 is available now at better Computer Dealers Nationwide. If your dealer doesn't have them yet, write or call and we'll tell you where you can buy one.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(For More Information Circle 27)

COMPANY/*Model*	**PRICE**	**WEIGHT (lbs.)**	**SIZE (HxWxD)**	**CONFIGURATION**	**OPTIONS**
Chicago Comp. Conn					
CCC Portable ATC	$1,599	28	same as XTC	80286, 6- and 10MHz, 640k, 1.2Mb FD, P port, seven slots (five open), 9-in. monitor, monochrome or composite color card, 191 W, AT-style keyboard.	30Mb HD, $649; 40Mb HD, $699; 80Mb FD, $999; 360k FD, $149; 1.2Mb FD, $149; P and S ports, $89.
Compaq					
Portable	$2,199	31.3	8.8x20x16	8088 CPU, 4.77MHz, 256k, two 360k FDs, S, P, RGB, composite, light pen, and RF ports, five slots (three open), 9-in. monitor, 120 W, XT-style keyboard.	10Mb HD, $1,199; 256k RAM upgrade, $75; clock/communications board, $150; case, $75; EGA, $599; EGA monitor, $799.
Portable II	$2,999	25.6	7.5x17.7x13.9	80286 CPU, 8MHz, 256k, two 360k FDs, S, P, RGB, composite, light pen, and RF ports, four slots (two open), 9-in. monitor, 120 W, AT-style keyboard.	Base plus 640k, one 360k FD, and a 20Mb HD, $4,499; 512k, $199; memory expansion board, $475; 1.2 Mb FD, $275; same EGA & monitor as Portable.
Cordata					
ATP-8-Q	$2,195	38	9.6x18.8x19.8	80286 CPU, 8MHz, 512k, 1.2Mb FD, S and P ports, four open slots (three AT, two XT), 9-in. monitor, 130 W, AT-style keyboard.	1.2Mb FD, $295.
ATP-8-Q20	$2,895	38	9.6x18.8x19.8	same as ATP-8-Q, plus 20Mb HD, and three open slots (two AT, one XT).	
Panasonic					
Exec. Partner	$2,195	30	5x16x21.25	8086-2 CPU, 4.77- & 7.16MHz, 256k, two 360k FDs, S, P, and exp. box ports, one open slot, 11-in. plasma screen, 83-key keyboard, thermal printer.	Expansion box (three slots), $400.
Sanyo					
MBC 675	$1,199	28	7.8x18.3x12	8088 CPU, 4.77MHz, 256k, two 360k FDs, S and P ports, three slots (two open), 7-in. monitor, 70 W, XT-style keyboard.	None avail. from Sanyo
MBC 775	$1,799	40	8.5x20.5x16.25	8088 CPU, 8MHz, 256k, two 360k FDs, P port, three slots (two open), 9-in. color monitor, 80 W, XT-style keyboard.	Base plus 4.77- & 8MHz switchable clock speeds, $1,999
Tech PC					
PC 88	$899	35	8.5x16.5x18.5	8088 CPU, 4.77MHz, 640k, 360k FD, P port, six slots (four open), 9-in. monitor, Hercules-compatible graphics card, 135 W, PC-style keyboard.	Base plus 4.77- & 8MHz switchable clock speeds, $999; 360k FD, $109; 20Mb HD and controller, $450; modem, $200; S port, $49.
PC 286	$1,799	35	8.5x16.5x18.5	80286 CPU, 8MHz, 512k, 1.2Mb FD, P port, six slots (four open), 9-in. monitor, Hercules-compatible graphics card, 195 W, AT-style keyboard.	Base plus 8- & 10MHz switchable clock speeds, $1,999; 20Mb HD, $400; P and S ports, $120.

b-backlit, CC-clock/calendar, EL-electroluminescent, EMS-extended memory specification, exp.-expansion, ext.-external, FD-floppy disk, fl-fluorescent, GP-game port, HD-hard disk, in.-inch, Inc.-included, k-kilobytes, LCD-liquid crystal display, MHz-megahertz, Opt.-optional, P-parallel, prop.-proprietary, RF-radio frequency, RGB-red, green, blue, S-serial, SCSI-small computer systems interface, st-supertwist, W-watts

PORTABLES/TRANSPORTABLES MANUFACTURERS

Bondwell Industrial Co., Inc.; *47358 Fremont Blvd., Fremont, CA 94538; (415) 490-4300 (For more information, circle 271.)*

Chicago Computer Connection; *5239 North Harlem Ave., Chicago, IL 60656; (312) 774-1687 For more information, circle 272)*

Compaq Computer Corp., Inc.; *20555 FM 149, Houston, TX 77070; (713) 370-0670 (For more information, circle 273.)*

Cordata Technologies, Inc.; *2001 Corporate Center Drive, Newbury Park, CA 91320; (805) 375-1500 (For more information, circle 274.)*

Data General Corp.; *4400 Computer Drive, Westboro, MA 01580; (617) 366-8911 (For more information, circle 275.)*

Datavue Corp.; *One Meca Way, Norcross, GA 30093; (404) 564-5555 (For more information, circle 276.)*

Grid Systems Corp.; *2535 Garcia Ave., Mountain View, CA 94043; (800) 222-GRID or (415) 961-4800 (For more information, circle 277.)*

Hewlett-Packard Co.; *1820 Embarcadero Road, Palo Alto, CA 94303; (800) 367-4772 (For more information, circle 278.)*

IBM Corp.; *Old Orchard Road, Armonk, NY 10504; (800) 447-4700 (For more information, circle 279.)*

Kaypro Corp.; *533 Stevens Ave., Solana Beach, CA 92075; (619) 481-4300 (For more information, circle 280.)*

NEC Home Electronics; *1255 Michael Drive, Wood Dale, IL 60191-1094; (312) 860-9500 (For more information, circle 281.)*

Panasonic Industrial Co.; *2 Panasonic Way, Secaucus, NJ 07094; (201) 348-7000 (For more information, circle 282.)*

Sanyo Business Systems Corp.; *51 Joseph St., Moonachie, NJ 07074; (201) 440-9300 (For more information, circle 283.)*

Sharp Electronics Corp.; *Systems Division, Sharp Plaza, Mahwah, NJ 07430; (800) 526-0264 or (201) 529-9500 (For more information, circle 284.)*

Tech PC; *1911 Betmar Lane, Anaheim, CA 92805; (714) 385-1711 (For more information, circle 285.)*

Toshiba America, Inc.; *Information Systems Division, 9740 Irvine Blvd., Irvine, CA 92718; (714) 380-3000 (For more information, circle 286.)*

Wang Laboratories, Inc.; *One Industrial Ave, Lowell, MA 01851; (800) 522-WANG (For more information, circle 287.)*

Zenith Data Systems; *1000 Milwaukee Ave., Glenview, IL 60025; (800) 842-9000 or (312) 699-4800 (For more information, circle 288.)*

(For more information on all the products listed in this buyers guide, circle 289.)

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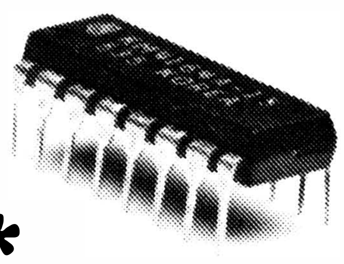

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Delta *Direct Access*	48.25*
Enertronics *Energraphics 2.0*	275.00*
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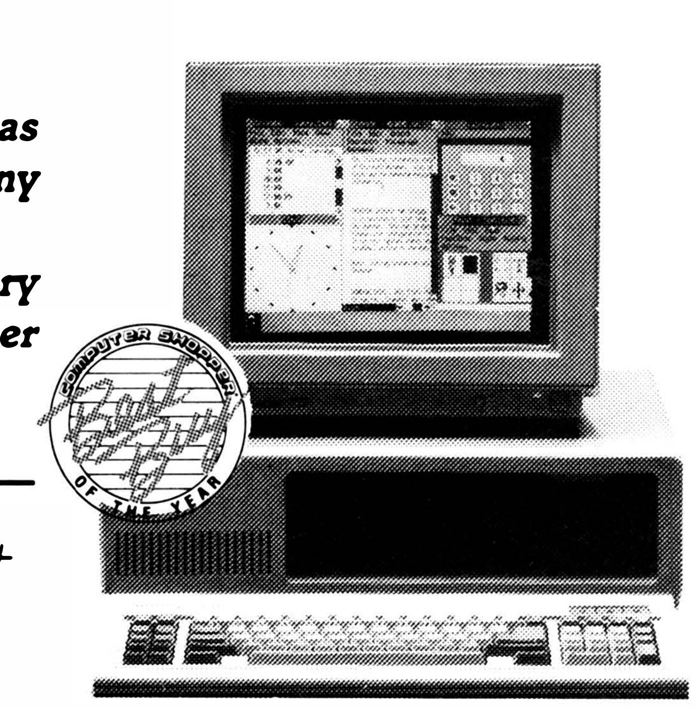

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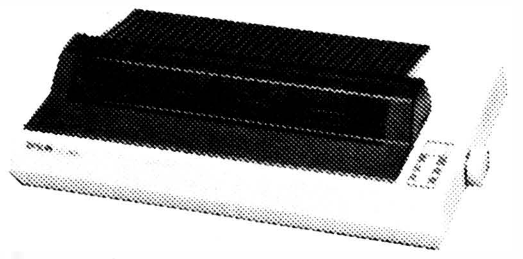

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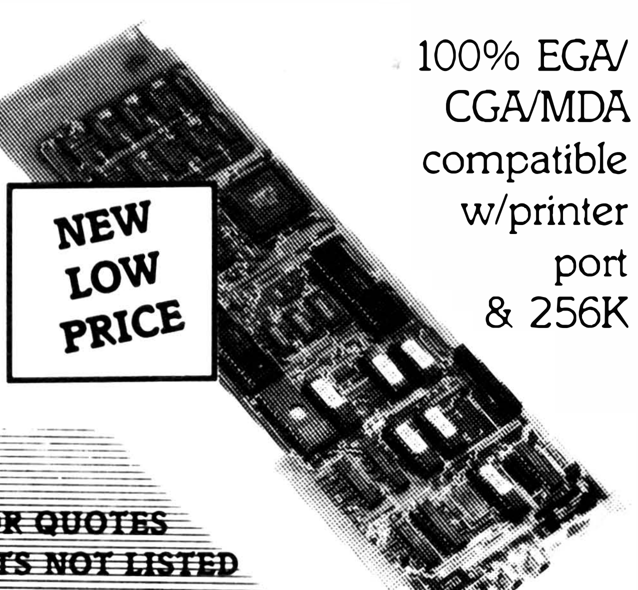

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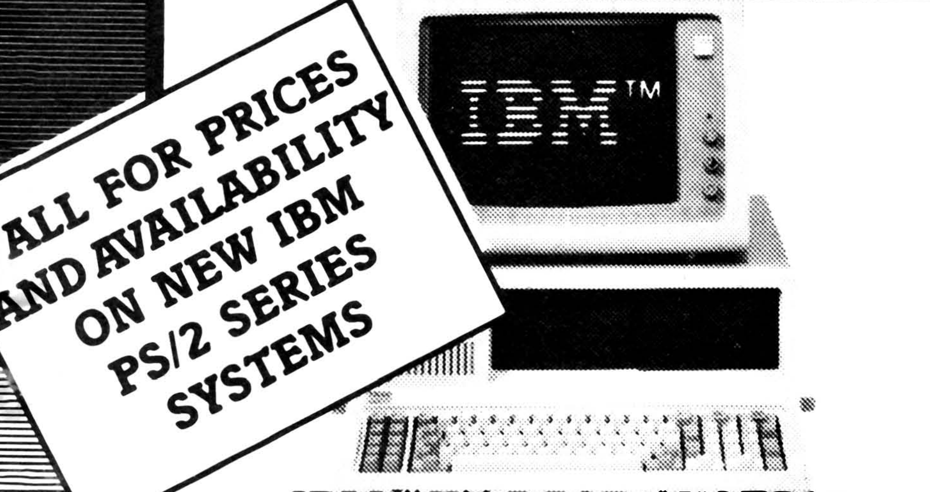

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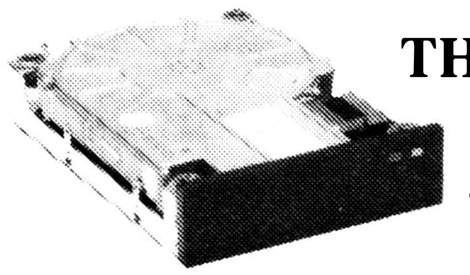

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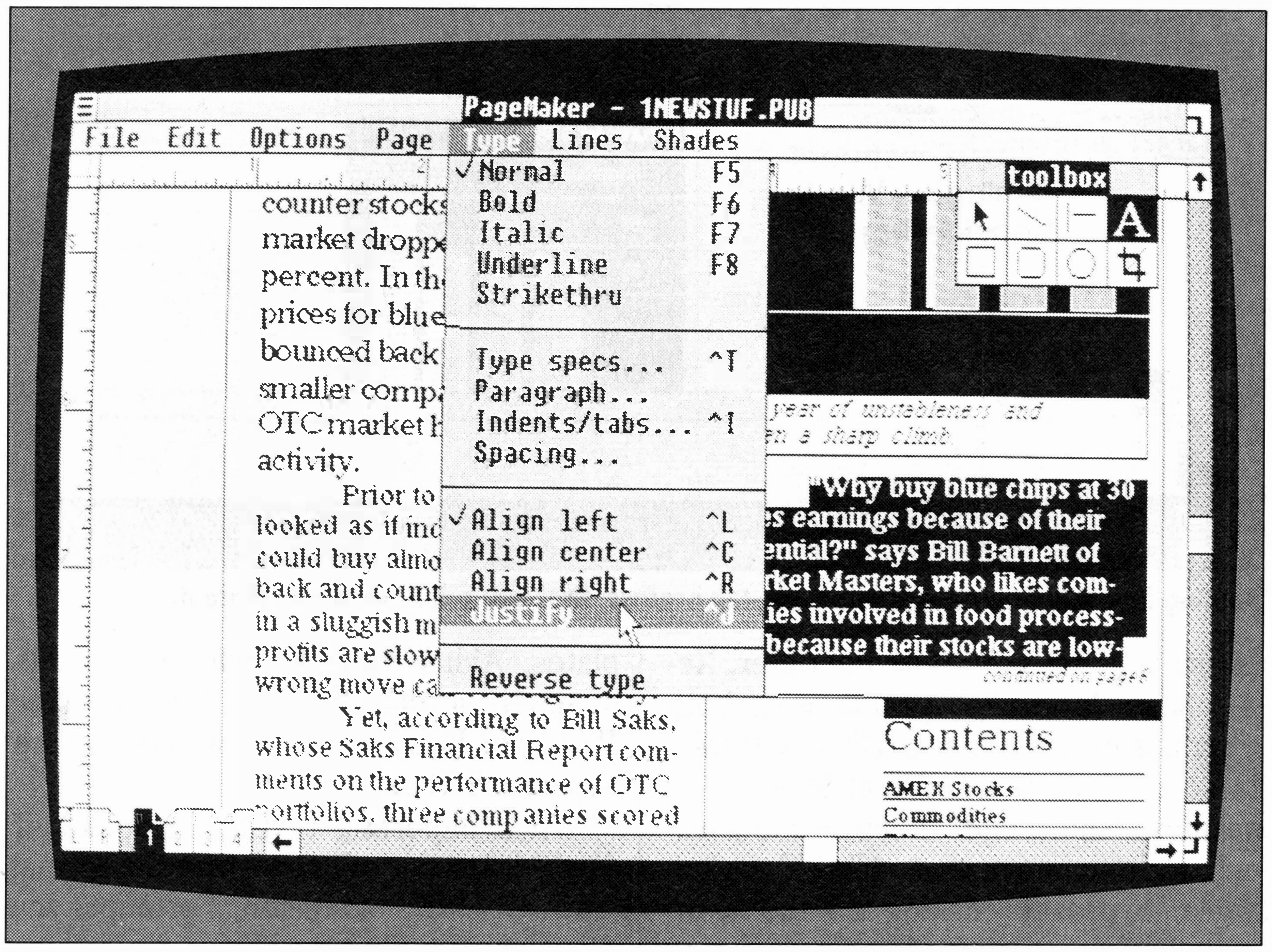
PRODUCT REVIEWS

A critical look at the latest computer hardware and software.

PageMaker Goes MS-DOS

PAGEMAKER FOR THE PC *requires an IBM PC AT or compatible computer with at least 512k, one double-sided disk drive, a 10Mb hard disk, an IBM Enhanced Graphics Adapter or Hercules Graphics Card or other Microsoft Windows-compatible graphics adapter and display, and a mouse; not copy protected; $695 retail; Aldus Corp., 411 First Avenue South, Suite 200, Seattle, WA 98104; (206) 622-5500. (For more information, circle 262 on one of the Free Information Cards.)*



With the menus, you hold the mouse button as you drag it, then release to enter a selection.

No program has done more to establish the credibility of the Apple Macintosh as a business tool than PageMaker. With desktop publishing as the wedge used by Apple to get the Mac in the corporate door and PageMaker the premiere program in that field, the Apple-Aldus alliance has proven one of the more successful in personal computing's short history. But with IBM-compatible computers still solidly the corporate standard, it was inevitable that Aldus would set its sights on the larger market.

Now that PageMaker for the PC is here, the temptation is to marvel at Aldus's technical accomplishment. But PageMaker can't be reviewed in a vacuum. People need to compare it to the Mac version as well as to the desktop publisher that beat PageMaker's PC version to market by three months—Ventura Desktop Publisher from Xerox Corp.

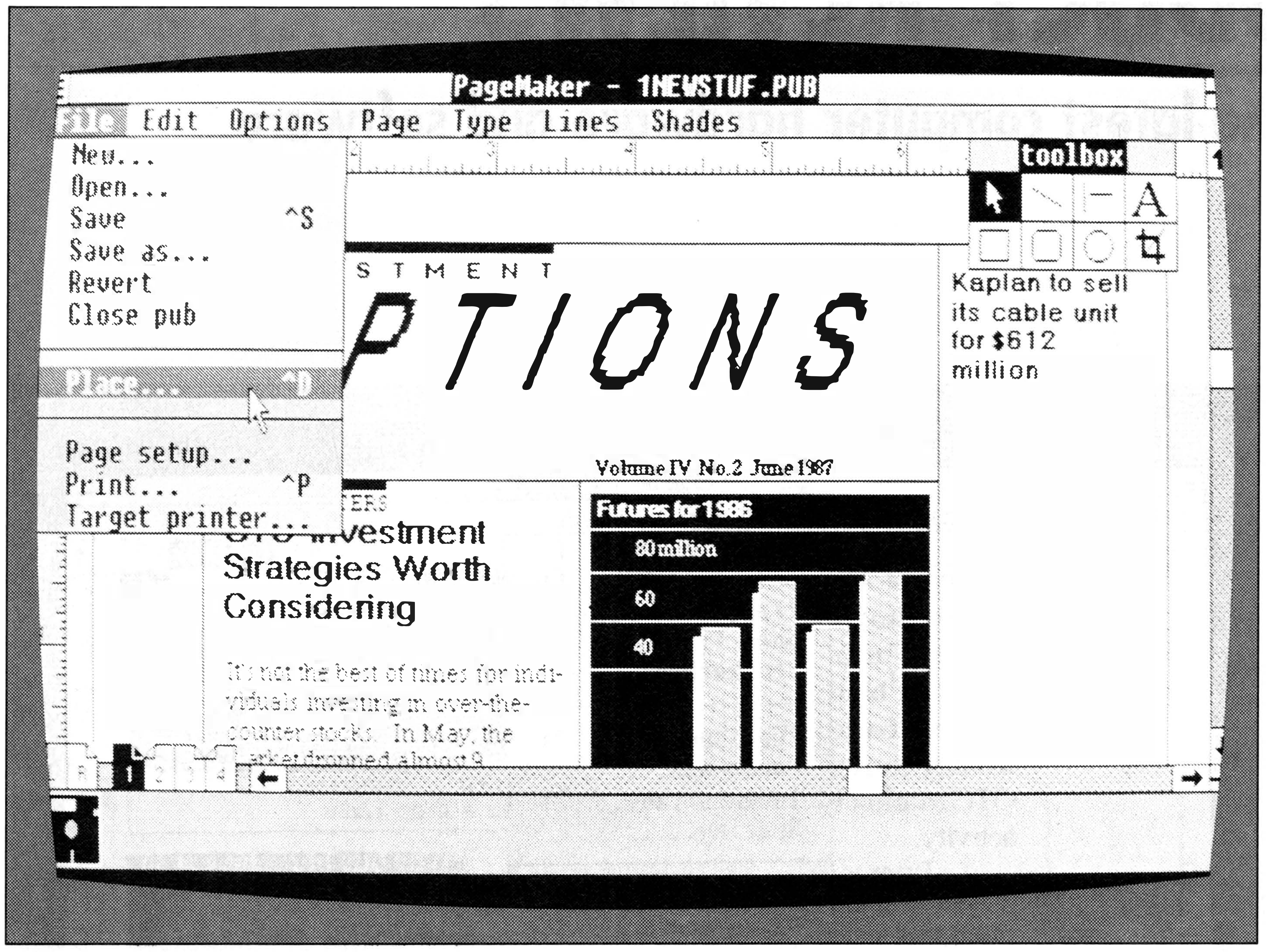
All desktop publishing programs enable you to merge text with drawings or scanned photos, and all give you complete control over the makeup of the page. This might include a mix of type styles and sizes, columns, rules and shadings. PageMaker and Ventura both encourage you to do your word processing in a word processor, then move the text into the desktop publishing program for formatting. PageMaker uses the command "place" to describe what Ventura calls "import."

"Look at the colors," was the first comment from one of our resident Mac mavens upon spying PageMaker running on an EGA-equipped IBM AT. We immediately switched into Window's display control panel so he could see all the colors. People proficient in the Mac version will have no trouble learning the PC version since, basically, it is the same program. You see the on-screen equivalent of a paste-up board. There are the same pull-down menus and dialog boxes. However, there are a number of features you won't find on earlier versions of PageMaker for the Mac. PageMaker 2.0 for the Mac, which is priced $200 less than the PC version, added those features when it shipped this spring. They include automatic hyphenation and justification, kerning, the capacity to work on longer documents, and the ability to work on facing pages interactively.

Installation of PageMaker takes about 15 minutes. You copy five disks to about 1.5Mb of your hard disk. PageMaker packages shipped since May 1 include only a run-time version of Windows, which means you won't get its word processing and drawing programs. Before beginning the page layout process, you need to pick a target printer. We chose Hewlett-Packard's LaserJet Series II printer.

Anyone who has grown accustomed to the way Ventura handles a mouse will notice that Aldus's implementation is almost the opposite. With Ventura, whenever the cursor strays into the command menu along the top of the screen, all the menu choices under that category pop down. You then click on your choice. With PageMaker, you must first click on the command line, hold down the button, and drag the mouse to the appropriate choice as each shingle unfolds. Letting go of the button as a particular option is highlighted enters that selection. The advantage of PageMaker is that menus aren't popping down when you don't intend them to. (Ventura, in fact, forces you to click on another section of the screen to make an unwanted menu disappear.) The disadvantage of the PageMaker approach is that you have to be agile enough to let go of the button at just the right moment to make the selection.

Mice take warming up to in any case. When the two leading desktop publishing programs follow opposite conventions, the result is trouble. For an analogy, think about floor pedals in cars for a moment: one manufacturer, Aldus, is in ef-



Kaplan to sell its cable unit for $612 million

Investment Strategies Worth Considering

Inputing files into PageMaker is a two-step process; first you call it, then you place it.

fect saying "let go" while the other, Xerox, says "press." Working with both programs makes one feel a little schizoid. As soon as we learned that PageMaker includes "shorthand" keyboard equivalents for mouse functions (Ctrl-T, for example, bypasses clicking on the word "type" on the command line to bring up the typeface dialog box), we stopped using the mouse for most functions. We initially found PageMaker's activation of the second Microsoft mouse button disconcerting. (Ventura uses only one button.) Until we realized it was a toggle between a mini- and full view of the page, pressing it was like triggering an ejector seat.

One appealing interface in PageMaker is the ability to grab an entire view and move it in any direction—to see a section of the page that had been offscreen.

Unlike Ventura, PageMaker does not come with preformatted style sheets. With Ventura you can go to the appendix of the manual and pick one of 20 designs, including a letterhead, a two- or three-column newsletter, or a book chapter. A user in a hurry can choose a style that most closely matches the design he or she has in mind. PageMaker, on the other hand, opens with a blank page. You can create what PageMaker calls "master pages" for reuse, but from the point of view of the novice or the person who just doesn't want to be bothered moving column guides around, PageMaker templates would make the program faster to use. (Recognizing the advantage of templates, Aldus plans to release, by this summer, a PC version of PageMaker Portfolio: Designs For Newsletters as a separate $79 purchase.)

When importing text and graphics, if PageMaker doesn't recognize the format through a file's extension, it prompts you to select the file type. Your choices are Windows Write, Microsoft Word, WordPerfect, MultiMate, WordStar, ASCII, or DCA text. Except when reading plain ASCII text, PageMaker recognizes much of the formatting, including tabs, bold and underlined text, and some font specifications. Unlike Ventura, bringing in a file from another program is a two-step procedure. First you call up the file, then you issue a separate command to place it. The PageMaker pointer turns to a text icon for word processing or to a paintbrush for graphics. This is an advantage over Ventura, which automatically places a file in the currently active frame. If the frame you had intended as the destination is not active, the information will end up in the wrong place. PageMaker, by giving you an extra step, lets you recheck or change the position on the page just prior to placing the data.

PageMaker, like Ventura, includes a limited text editor to enable you to make last-minute changes. You can type in words, make deletions, and cut and paste text. Editing also lags a little on the screen with PageMaker, since in its graphics-based environment, characters are processed proportionally.

Suppose you do make changes in the text using PageMaker's editor, but then you decide that even more rewriting is necessary and that you'd be better off getting back to your word processor. PageMaker does not save its files in the original word processing format, so if you decide to go back to the word processing file, you're starting at the point where the document was originally.

With Ventura, imported documents are saved in their original files. Thus, when you reopen the document in, say, WordPerfect, you'll see any edits and format codes composed while the file was loaded in Ventura. Ventura always loads a chapter with the most current version of the word processing and graphics files associated with it. That's why PageMaker emphasizes placing word processing files in it only as a last step before you begin the design process.

In that regard, PageMaker requires more discipline from its users. While Ventura allows you to return to your word processor at any stage, PageMaker says you better plan on getting the words right before bringing them into the design process. (Aldus is beginning to recognize this limitation. PageMaker 2.0 for the Mac includes, for the first time, a file export feature that gives users the option of updating all of their Microsoft Word files.)

PageMaker places a "+" in a handle at the bottom of a column to indicate excess text. You click on it, then click where you want to place the run-over. Later format and text changes will ripple throughout these linked sections. Letting text flow around a graphic isn't nearly as automatic in PageMaker as it is in Ventura. With Ventura, you can create a frame within a body of text, and the words will wrap around it. PageMaker uses a more laborious process in which you have to grab and move the boundaries of the text to get it to wrap properly.

PageMaker's most serious drawback is its one-way direction limitation for incorporating word processing files. Its biggest plus is its flexibility for designers who want every page of a publication to look different, and the fact that the layout of the screen mimics a drawing board. PageMaker can do "tiling," a command that lets you print sections of an oversized page on a laser's letter-size paper and paste them together. (Ventura 1.1 adds this feature with its PostScript and Interpress drivers.) Both programs address a wide range of printers including those containing PostScript, so files can be fed to higher-quality typesetting equipment.

—Michael Antonoff

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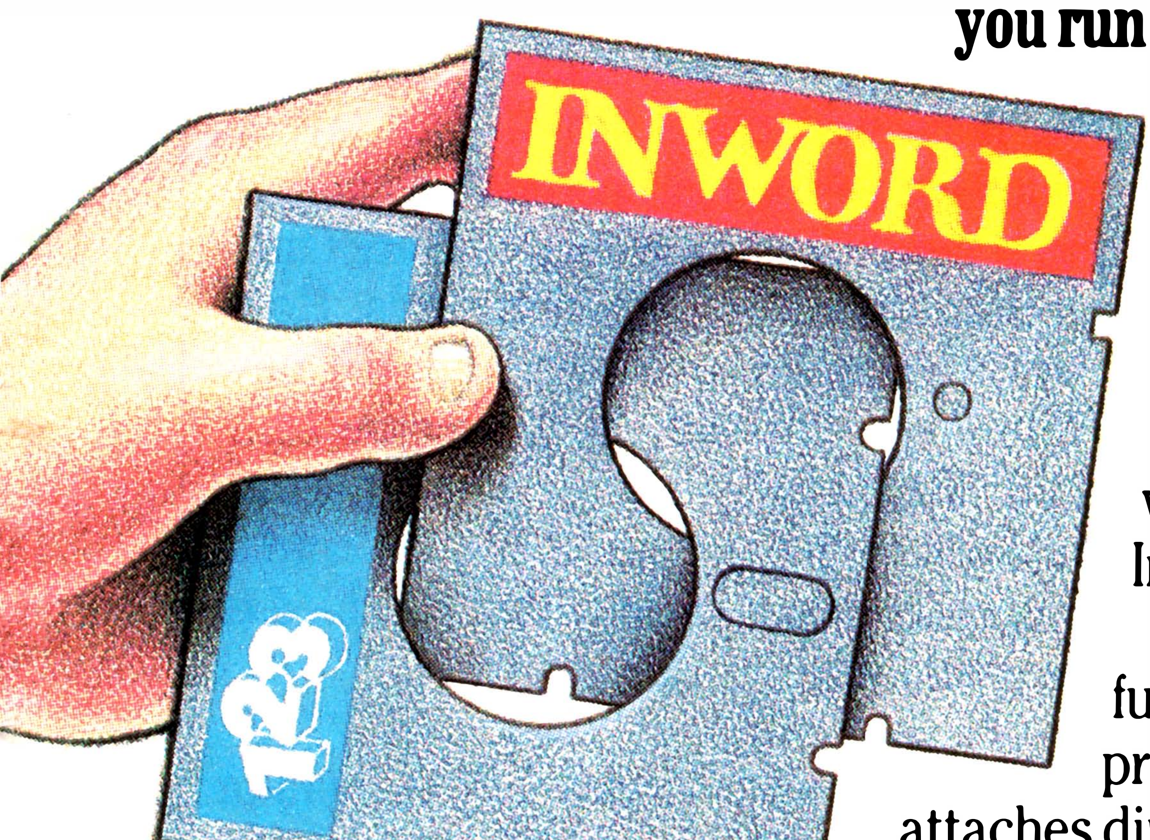

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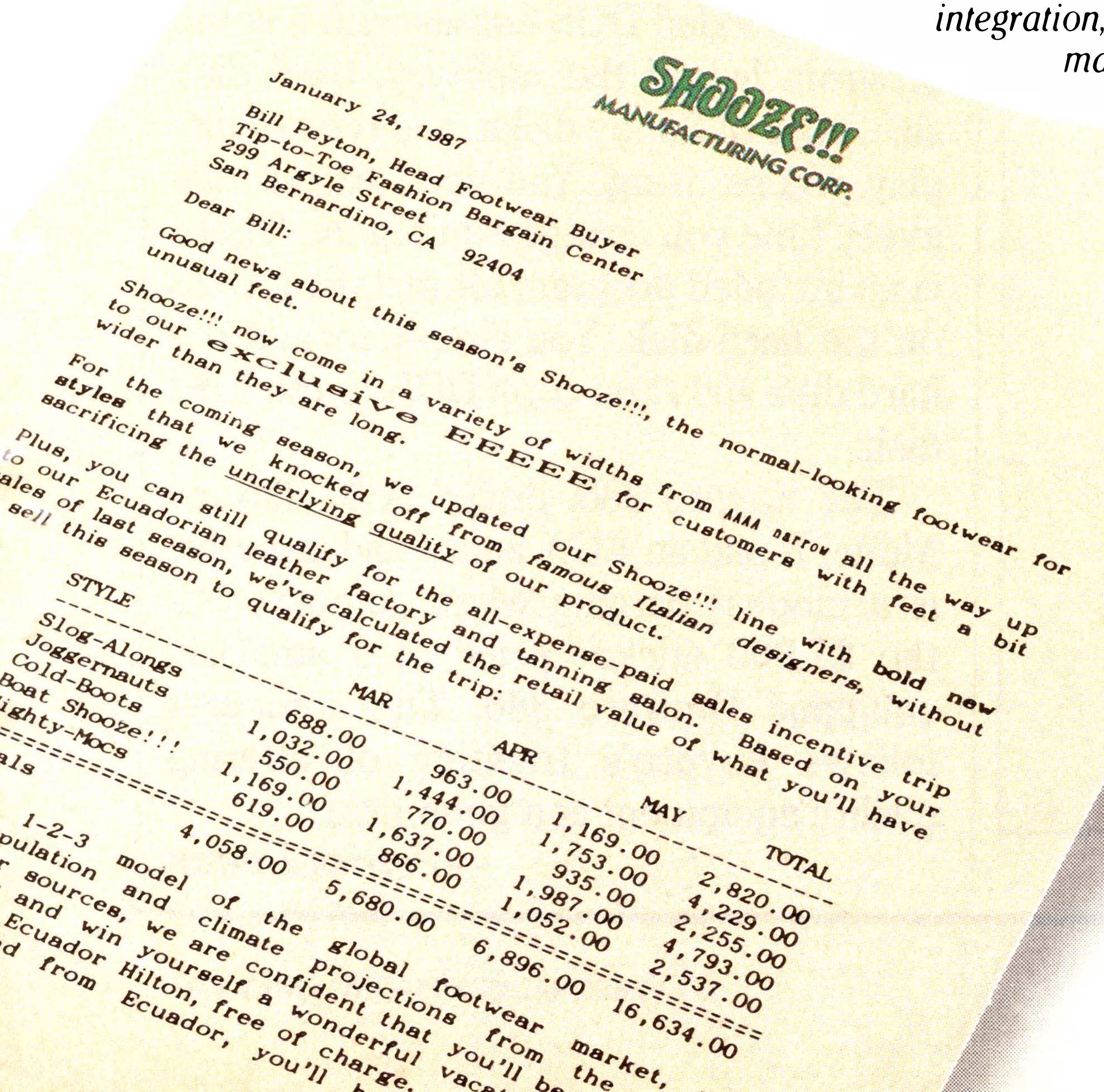
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MANUFACTURING CORP.

January 24, 1987

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STYLE	MAR	APR	MAY	TOTAL
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Joggernauts	1,032.00	1,444.00	1,753.00	4,229.00
Cold-Boots	550.00	770.00	935.00	2,255.00
Boat Shooze!!!	1,169.00	1,637.00	1,987.00	4,793.00
ighty-Mocs	619.00	866.00	1,052.00	2,537.00
als	4,058.00	5,680.00	6,896.00	16,634.00

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sources, we are confident that you'll be
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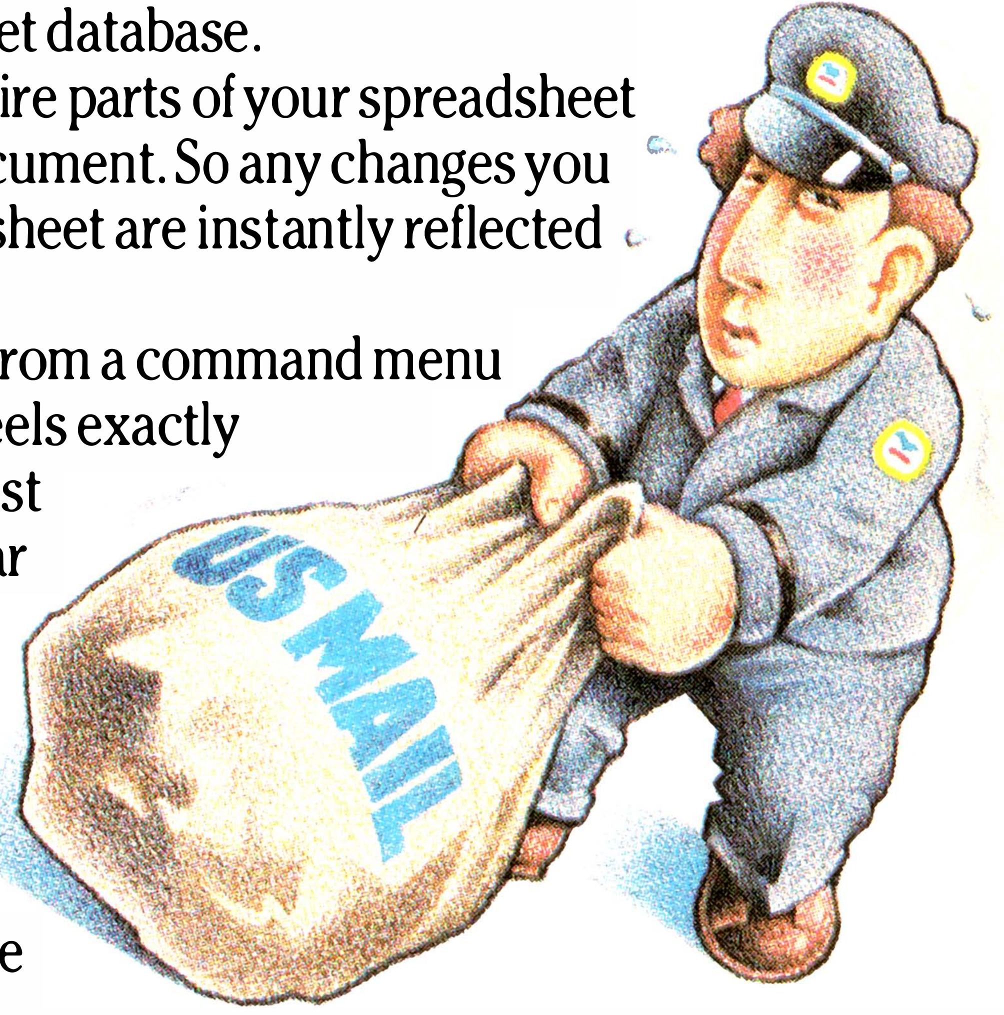

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Requires 1-2-3 Version 2. Will **not** run with Version 1 or 1A.

Funk Software, 222 Third Street, Cambridge, MA 02142

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(For More Information Circle 71)

Value In Price And Performance

THE KAYPRO 386 *is an 80386-based computer available in the following configurations: a 1.2Mb disk drive and 512k of RAM, $4,995; a 1.2Mb disk drive, a 40Mb hard disk, and 1Mb of RAM, $6,295; and a 1.2Mb disk drive, a 130Mb hard disk, and 1Mb of RAM, $8,595; Kaypro Corp., PO Box N, Del Mar, CA 92014; (619) 481-4300. (Circle 263 on one of the Free Information Cards.)*

The key to buying an IBM-compatible computer is to test for "CPR"—compatibility, price, and reliability. More and more computer manufacturers are learning the value of these three ingredients, but Kaypro has known it all along. It continues the tradition with the Kaypro 386.

The 386 is Kaypro's bid to wow users who need the processing speed of the powerful Intel 80386 chip. The computer is available in three basic models, and Kaypro provides a variety of hard disks, tape backup units, monitors, video boards, and other peripherals for them. We reviewed the $6,295 40Mb version and added Kaypro's EGA board ($325) and EGA monitor ($595). A network file server version, expected later this summer, will include a 240Mb or 330Mb hard disk and cost $14,950 or $19,950.

With a 16MHz clock speed, the Kaypro 386 is definitely fast. We used a software utility called PowerMeter from the Database Group in San Jose, Calif., to test just how fast. Head to head against the Compaq Deskpro 386, the Kaypro was slightly faster in the system tests, which simulate applications such as a spreadsheet, data base, word processor, and CAD/CAE. The Deskpro 386 scored higher in the processor and memory tests but had the advantage of a math coprocessor, something our Kaypro lacked.

Outwardly the Kaypro 386 is quite staid. Its murky gray coloring and beige trim make it look like a hundred other compatibles. Given the power contained inside, this is a bit like putting the engine of an Indianapolis 500 race car into a Chevy Impala. In size, the Kaypro 386 is slightly larger (but lighter) than the Deskpro 386: 21 by 17 by 6.5 inches and 38 pounds for the Kaypro versus 19.8 by 16.5 by 6.4 inches and 42 pounds for the Deskpro.

There is room for two floppy drives and an internal half-height tape backup unit stacked on top of each other at the right front of the computer. The system lock, and power-on and hard disk access lights are slightly to the left of center along the front—exactly as on an IBM AT. The on/off switch is located on the right side and toward the rear. Someday soon, we hope, manufacturers will follow the design of the new IBM PS/2 computers by locating the power switch on the front of the computer.

The Kaypro 386's staid appearance belies a 16MHz clock speed and 80386 processor.

Inside, there are four AT-style slots and three XT-style slots for expansion boards. That's a generous number of slots, considering that the Kaypro 386 comes with a parallel port and clock/calendar built in. The 215-watt power supply should amply handle a full complement of add-in boards.

The keyboard layout, based on the IBM Personal Computer RT, has the 12 function keys located horizontally above the main section of keys. The layout, which we've seen in a number of computers recently, is confusing if you are familiar with the older IBM keyboards. However, this is the basic design of the new PS/2 line, so it will likely become standard. The keyboard plugs into a port on the back of the computer, and the cord is long enough so you don't feel shackled to the computer.

We reviewed Kaypro's EGA monitor and EGA board with the computer. Text and graphics were sharp and clear and the colors well defined. The on/off switch and adjustment knobs were conveniently located on the front of the monitor. Text can be displayed in white on a black background, or you can switch the display color to green simply by pressing one of the knobs that are on the front of the monitor.

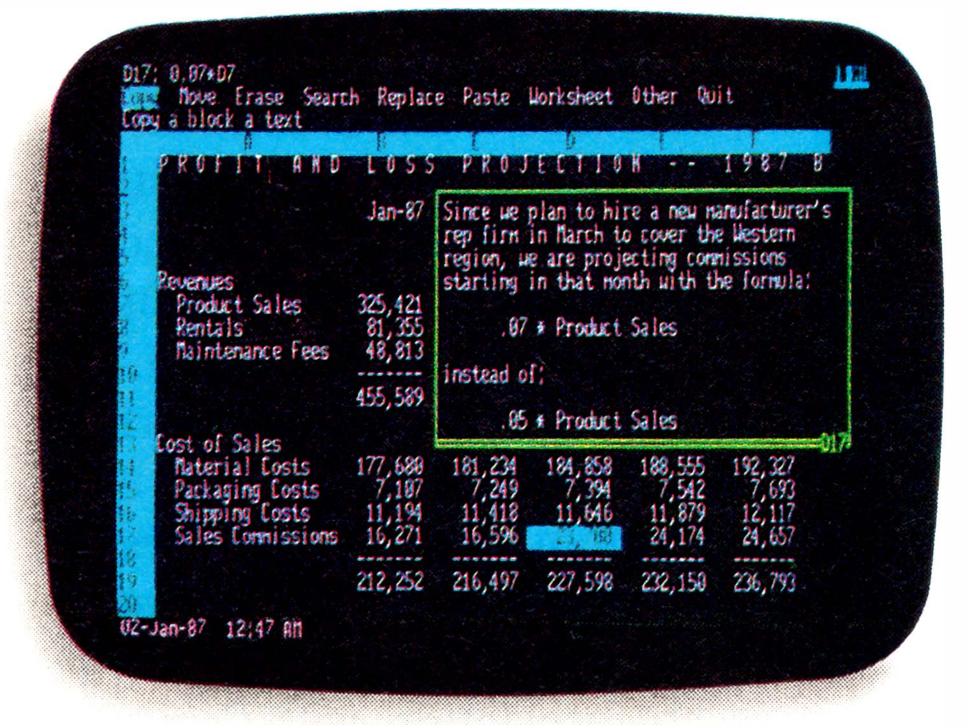
One feature that made Kaypro computers a good value in the past was the wide assortment of bundled software. This is not the case with the Kaypro 386, although it does come with MS-DOS 3.21, GW-Basic 3.21, Quarterdeck's Expanded Memory Manager, and a hard disk utility called SpeedStor. Besides formatting the hard disk, SpeedStor can test for and lock out bad sectors, park the hard disk head, and perform hard disk diagnostics.

The included DOS comes with a setup program listing the memory, hard disk size, type of floppy disks, and type of display you're using. You need to run this every time you change equipment. There is no included program for installing DOS on the hard disk. You simply format the hard disk and then copy DOS to the hard disk.

The Kaypro 386, priced at $7,215 for Model E and an EGA board and monitor, is a modest bargain when compared to the $7,900 sticker price of a similarly equipped Deskpro 386. The computer follows Kaypro's tradition of offering quality equipment at a good price.

—Patrick Honan

What's friendly, powerful and remembers everything about your 1-2-3 spreadsheets?



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                   Jan-87  Since we plan to hire a new manufacturer's
                           rep firm in March to cover the Western
                           region, we are projecting commissions
 Revenues                  starting in that month with the formula:
   Product Sales  325,421
   Rentals         81,355          .07 * Product Sales
   Maintenance Fees 48,813
                  -------  instead of:
                  455,589
                                   .05 * Product Sales
 Cost of Sales                                                  D17
   Material Costs  177,680  181,234  184,858  188,555  192,327
   Packaging Costs   7,187    7,249    7,394    7,542    7,693
   Shipping Costs   11,194   11,418   11,646   11,879   12,117
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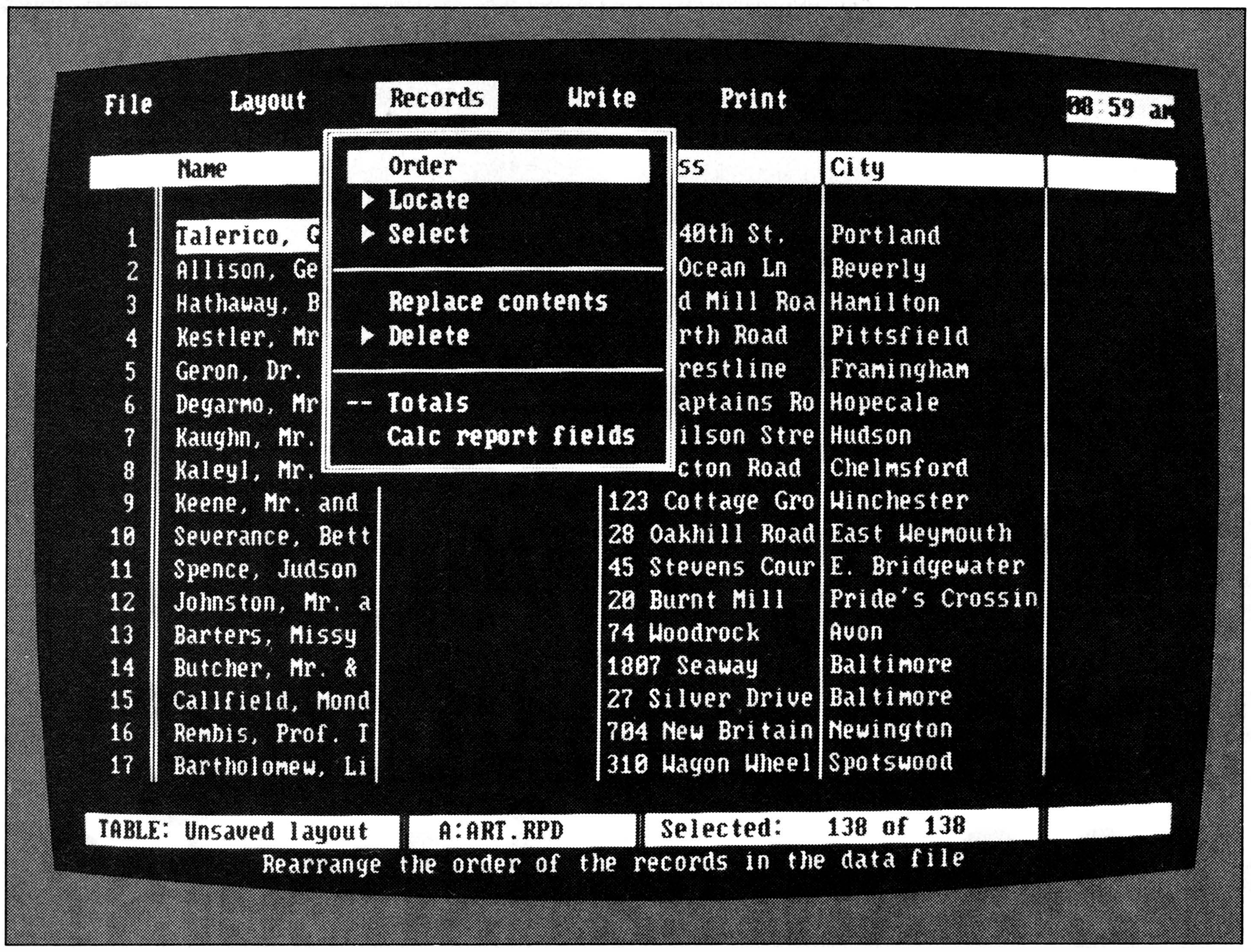

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  2 ║ Allison, Ge                       Ocean Ln    Beverly
  3 ║ Hathaway, B                       d Mill Roa  Hamilton
  4 ║ Kestler, Mr                       rth Road    Pittsfield
  5 ║ Geron, Dr.                        restline    Framingham
  6 ║ Degarmo, Mr                       aptains Ro  Hopecale
  7 ║ Kaughn, Mr.                       ilson Stre  Hudson
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 16 ║ Rembis, Prof. I│         │704 New Britain│Newington
 17 ║ Bartholomew, Li│         │310 Wagon Wheel│Spotswood

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The pull-down menus in RapidFile eliminate the need to memorize all the needed commands.

Serious Filing

RAPIDFILE *is a data base program that runs on IBM or compatible personal computers with at least 256k of memory; $395 retail; not copy protected; Ashton-Tate Corp., 20101 Hamilton Ave., Torrance, CA 90502; (800) 437-4329. (For more information, circle 255 on the Free Information Card.)*

What price power? In the case of data base software there are often two stiff fees exacted, one monetary and one cerebral. The most powerful tools for managing information—programs such as dBase III Plus and R:base System V—cost upwards of $700 and can wrack the brain with their complex routines. Simple file managers are far less demanding on both counts, but their limited capabilities can leave you wanting. Ashton-Tate is among those publishers who now sense the need for some middle ground, and it has developed RapidFile to fill the void.

RapidFile is not the first data base to perch between the big guys and the little guys. PFS:Professional File, from Software Publishing, nimbly balances simplicity and sophistication. So does Symantec's Q&A (which also includes both an "intelligent assistant" to interpret plain-English commands and a word processor). RapidFile doesn't break any new ground at the cash register. At $395, it's fair game for critics of software pricing.

But RapidFile stands out where it counts most: getting results. Its range of capabilities and its lucid, straightforward approach make it one of the best mixes of power and ease-of-use we've seen. RapidFile nicely blends simplicity, speed, flexibility, and capacity. It has no programming language, nor does it possess relational features—that is, functions enabling you to establish working relationships between two or more files. But many people have no use (or no tolerance) for these features, anyway.

Getting started with RapidFile is amiable enough. The tutorial program gives a feel for how things work, and the learning guide explains the basics in more detail. Can't wait? Neither could we. You can go a long way in RapidFile with only its function-key cue card and the on-screen instructions summoned by the Help (F1) key. The main reason: menus. Virtually all maneuvers are initiated by menu choices that unfold (pull down) from the top of the screen. Anyone with Framework or Macintosh experience will feel right at home. If you prefer a horizontal menu scheme similar to that of Lotus 1-2-3, you can switch to that style with a single keystroke.

Menus and prompts move matters along in businesslike fashion. Creating a new data base, for example, takes only minutes. Choose "create" from the File menu, select "new file" from the menu that follows, then respond to prompts for field names and types (text or numeric). You can begin adding information to the table you've just created, editing your entries and adding fields as needed. Space isn't likely to be a problem; RapidFile can employ as many as 250 fields per record and up to 64,000 records per file. Done? Choose "save" from the File menu—or just hit Ctrl-Enter, one of the program's many shortcut commands.

RapidFile normally presents the information in your data base as either a table (where rows are records and columns are fields) or a form (a single record on the screen). You can "flip" between the two layouts with a single function key. You can also display records both ways at once using a split-screen layout—a neat touch that comes in handy.

Sifting through records is easy and, true to the name, rapid. Both the "order" and "select" options within the Records menu handle the sorting and searching chores, respectively. Each choice cues a fill-in-the-blanks screen so you can specify sequence priority or search criteria. Results come back in a hurry. The sorting and searching tests we devised using a data base of 100 records took RapidFile only two or three seconds apiece.

Getting your information on paper—into reports, onto labels, and in form letters—is easier with RapidFile than most. There are two report types: quick and custom. A "quick" report presents your records in table form; you need only eliminate the fields you don't want, then sort or total columns as necessary before printing. A "custom" report provides greater options, but it is more difficult to create.

You can create form letters with RapidFile's aptly named "memo writer." By inserting field names into the text of a letter created within the memo writer, you can print personalized form letters with a minimum of fuss. But don't throw away your word processor. While the memo writer has all of the basics (search and replace, moving blocks of text, and so on), its limit of 8,000 characters per file and its lack of a spelling checker make it most suitable for form letters and notes.

RapidFile has a host of other niceties. It enables you to create macros (commands that spew a series of keystrokes) to make moving about the menus faster. You can alter many of the program's default settings and import and export dBase, 1-2-3, PFS or comma-delimited ASCII files.

Not much about RapidFile is flashy. But its simple, no-nonsense modus operandi makes it all the more refreshing. If only its price were, too. Still, it's worth checking into as a superior medium-powered data base.

—Christopher O'Malley

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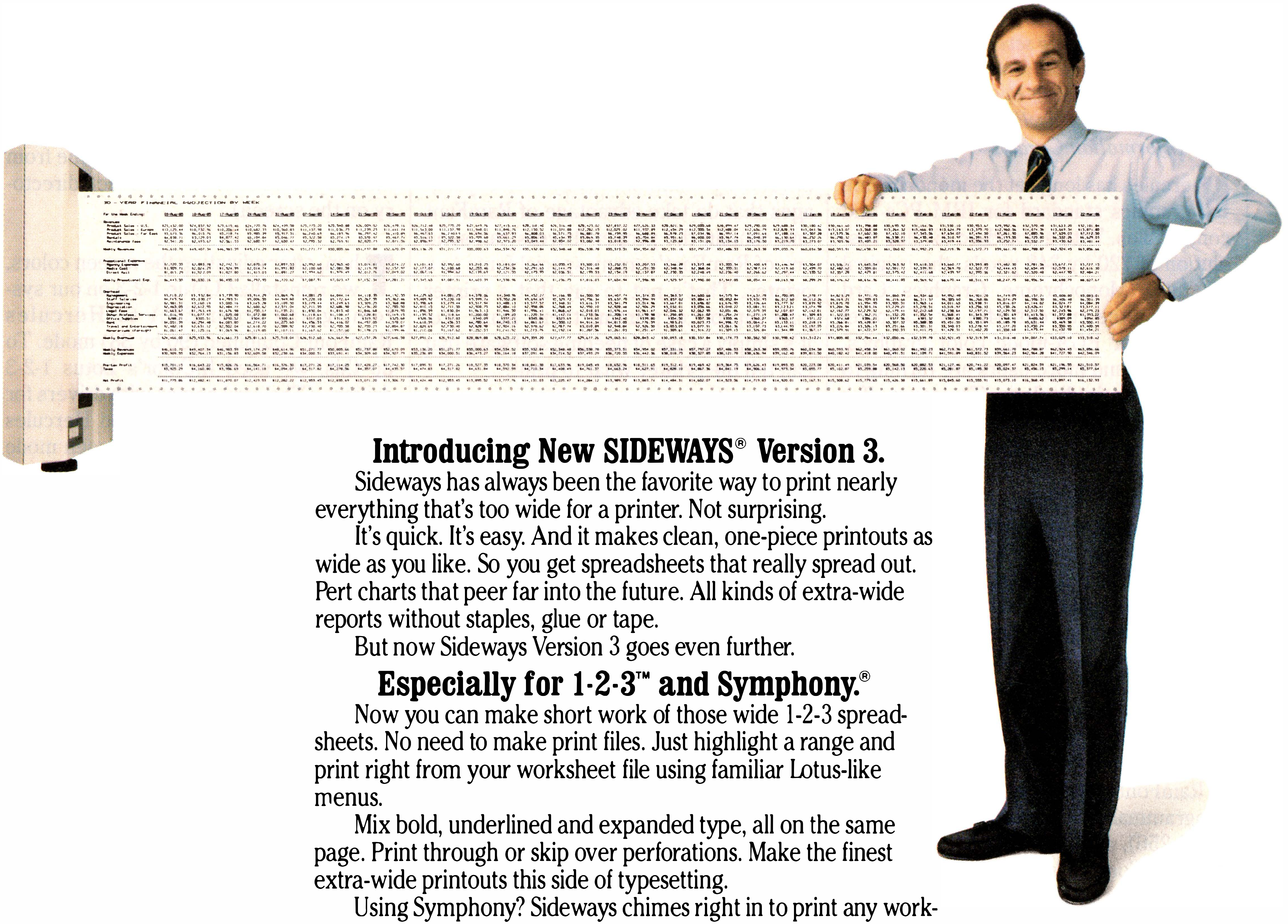

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(For More Information Circle 73)

Hercules Discovers Color Graphics

HERCULES INCOLOR CARD *runs on an IBM PC, XT, AT, or compatible, providing color graphics that are compatible with Hercules monochrome cards. It offers the capability of showing several fonts at once; $499 retail; Hercules Computer Technology, 2550 Ninth Street, Berkeley CA 94710; (415)-540-6000. (Circle 265 on one of the Free Information Cards).*

Hercules has long set the monochrome graphics standard for IBM PCs and compatibles. With a standard display resolution of 720 by 348 pixels, the original Hercules Monochrome Graphics Card surpasses the current 640- by 350-pixel standard for EGA-mode color graphics. Still, more and more users are turning to color for their displays. To stave off a mass migration, Hercules has announced a color sequel to its classic monochrome adaptor.

Called the InColor Card, the new graphics adapter sports the same display resolution as the older monochrome card, while offering such benefits as full software compatibility with both the original Hercules Card and the newer Hercules Graphics Card Plus, the ability to display 16 colors from a palette of 64 colors, a parallel printer port, a font editor, a graphics mode screen dump utility, and Hercules' new RamFont mode.

RamFont gives you access to 3,072 programmable characters (instead of the usual 256), allows programs such as Microsoft Word to scroll faster, makes it possible to create Lotus 1-2-3 graphs that appear in a 16-color window instead of taking over the entire screen, and allows many enhanced screen and printing options for software such as Lotus Manuscript, MultiMate, WordPerfect, WordStar, and others. Some of these options include on-screen italics, boldface, sub- and superscript, foreign and scientific character sets, and more. But, despite all of its features and benefits, the Hercules Incolor card is not for everyone.

Although the InColor card works with the same text-based software that runs on the Hercules Graphics Card, not every program is designed with drivers that take advantage of the additional features offered by RamFont. Only those packages that do take advantage of RamFont and contain the proper drivers can send any of RamFont's many special fonts to a printer. That's not to say that a printer isn't capable of printing them, many are; it's simply a case of needing software that can tell the printer what to print.

Another problem with the InColor card is that it requires a monitor of either the EGA or multiple scan rate variety. We attempted to use our Panasonic color monitor with the InColor card. It presented us with snow. Obviously, our monitor didn't make the grade, because when we replaced it with an NEC MultiSync, the MultiSync operated properly.

To use the InColor card, we disemboweled our trusty IBM PC and removed its existing video card. Often we leave adapter cards in a machine to determine their ability to coexist with those being tested. But in this case, the Hercules documentation cautioned us that "the Hercules Graphics Card (Model GB200) is the only video card we know of that can coexist under all circumstances in the same system with a Hercules InColor Card," so we decided to avoid potential video meltdown and removed the card.

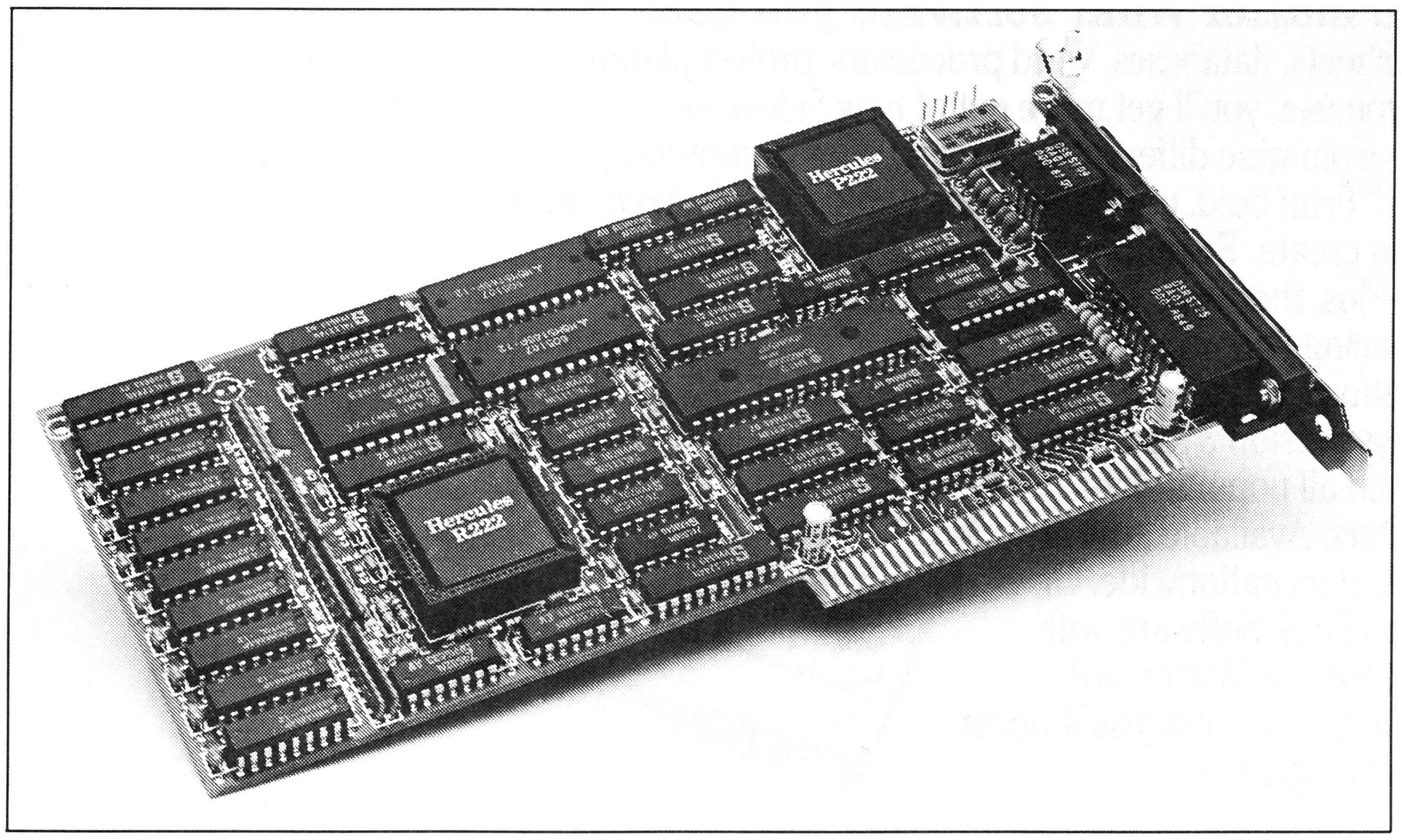
To test the InColor card, we first tried it out in RamFont mode. We exchanged screen fonts using fonts supplied on a disk that comes with the board. Some of the fonts were interesting and useful; others were difficult to read and seemed better suited to printing than to viewing. We encountered one unusual situation with a font called Greek. After loading the font, we realized very quickly that we couldn't read Greek. To get back to the standard font, we had to reinstall a font we had been using (typing the name from memory and not from the Greek directory on the screen).

Then, after adjusting the screen colors, we reinstalled Lotus 1-2-3 on our system, going from EGA to Hercules RamFont Combined (90 by 38) mode. To do this, we used InColor's Lotus 1-2-3 drivers. (The card comes with drivers for several popular packages, and Hercules promises more soon.) Our chosen mode allowed us to use small characters and display 1-2-3 graphs in a screen window. Using Lotus 1-2-3 in this way is nifty, but in some situations—apparently because of our chosen screen attributes—the cursor didn't blink. Everything else in 1-2-3 appeared to work properly, including windowed graphs.

We found another minor problem in the documentation. The table of contents page numbers in the owner's manual are incorrect. Not a major problem, but one which might cause frustration. And, although we didn't try any RAM-resident programs, the documentation warned us that RamFont mode might cause problems for some such programs.

The InColor card is a great idea hindered by the fact that some of its better features (printing RamFont or custom characters, for instance) require software support to be fully maximized. Accordingly, developers must allocate resources to write drivers for the board. In light of IBM's recent announcements, which included yet another graphics standard (VGA), development efforts may wane in favor of perceived greener pastures on IBM's farm. For ourselves, our EGA board will do just fine—not because it's better, but because we have no need for the benefits offered by the InColor card. If you do have a special need, such as desktop publishing or CAD or foreign language characters, the InColor card might be just the ticket. But if not, $499 may be too much to pay for Hercules graphics in color.

—*Amanda C. Hixson*



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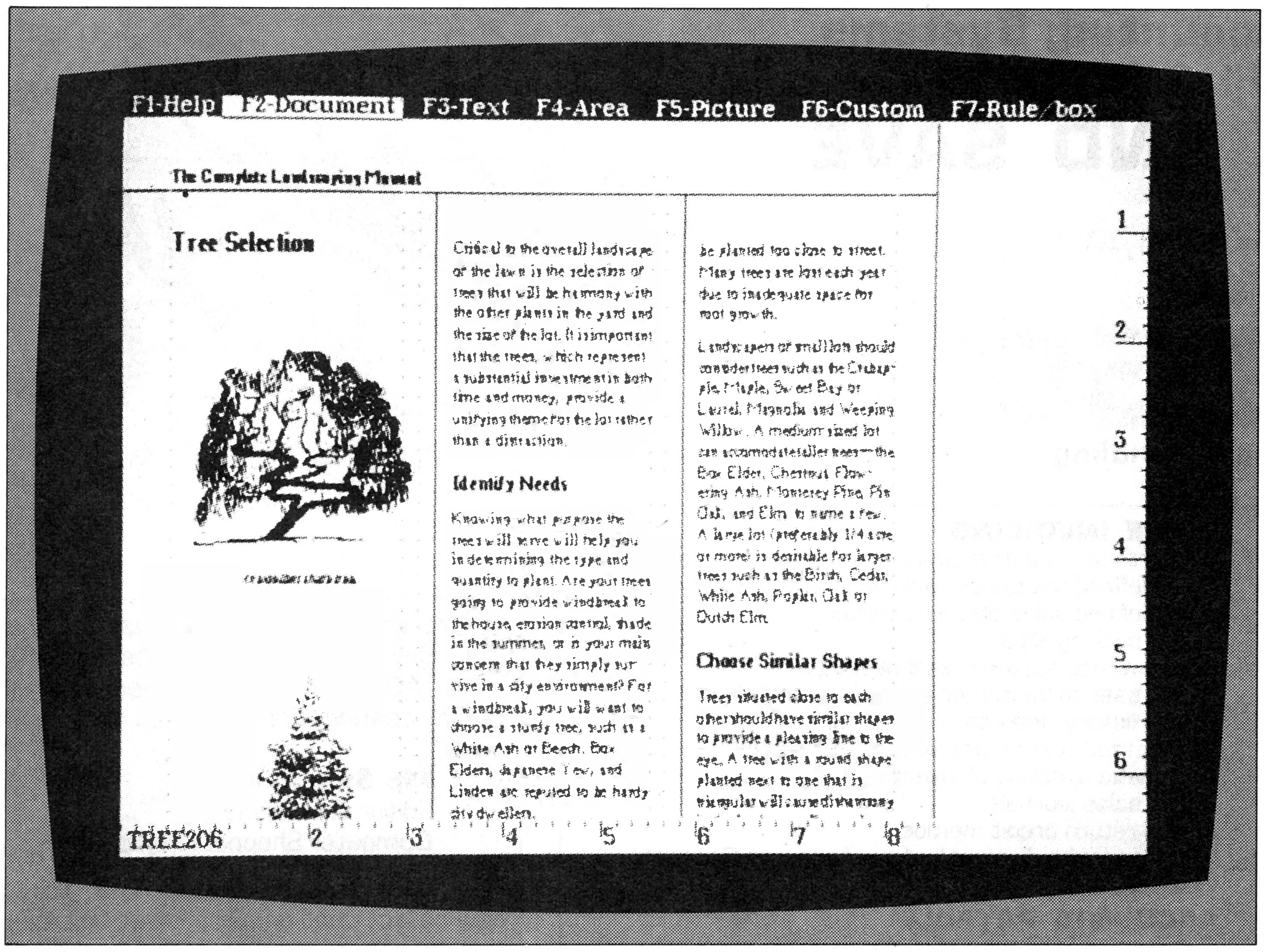

The Complete Landscaping Manual

Tree Selection

Critical to the overall landscape of the lawn is the selection of trees that will be in harmony with the other plants in the yard and the size of the lot. It is important that the trees, which represent a substantial investment in both time and money, provide a unifying theme for the lot rather than a distraction.

Identify Needs

Knowing what purpose the trees will serve will help you in determining the type and quantity to plant. Are your trees going to provide windbreak to the house, erosion control, shade in the summer, or is your main concern that they simply survive in a city environment? For a windbreak, you will want to choose a sturdy tree, such as a White Ash or Beech. Box Elders, Japanese Yew, and Linden are reputed to be hardy city dwellers.

be planted too close to street. Many trees are lost each year due to inadequate space for root growth.

Landscapers of small lots should consider trees such as the Crabapple, Maple, Sweet Bay or Laurel, Magnolia and Weeping Willow. A medium sized lot can accommodate taller trees—the Box Elder, Chestnut, Flowering Ash, Monterey Pine, Pin Oak, and Elm to name a few. A large lot (preferably 1/4 acre or more) is desirable for larger trees such as the Birch, Cedar, White Ash, Poplar, Oak or Dutch Elm.

Choose Similar Shapes

Trees situated close to each other should have similar shapes to provide a pleasing line to the eye. A tree with a round shape planted next to one that is triangular will cause disharmony

Guide rules at the bottom and right of the screen help you position text and pictures.

Custom Publishing

THE HARVARD PROFESSIONAL PUBLISHER *is a desktop publishing program for the IBM XT, AT, or compatibles. It requires 640k, a hard disk plus one floppy drive, and a Hercules Graphics Card with monochrome display or IBM EGA with 256k on the video card, and an Enhanced Graphics Display; noncopy protected; $695 retail; Software Publishing Corp., 1901 Landings Drive, PO Box 7210, Mountain View, CA 94039-7210; (415) 962-8910. (For more information, circle number 259 on one of the Free Information Cards.)*

Harvard Professional Publisher is a product for the computer user who knows something about page make-up and wants to develop up to 999 pages of text and graphics on a well-equipped system. If you're interested in creating memos and simple newsletters, Software Publishing's less expensive alternative, Clickart Personal Publisher, would be a better choice. With Harvard Professional Publisher, you'll get more control over the look of the output, but you'll do more work up front.

Harvard's Publisher package consists of six program disks, a font disk, and a tutorial disk.

Installing the program can cause some aggravation, particularly if it means upgrading an older system to meet the stringent hardware requirements. First, you need a full 640k of memory to run the program, no matter how long your document. This usually means doing without RAM residents, and the possibility you'll have to rewrite a line about buffers and files in your systems file to alleviate an "Insufficient Memory" message. By comparison, Xerox's Ventura Publisher lets you create documents of up to 20 pages with 512k.

Second, you must have a Hercules Graphics Card with monochrome display or an IBM EGA with 256k of video RAM aboard, and an Enhanced Graphics Display or compatible monitor. Third, a hard disk plus one floppy drive is required. And finally, you're going to need a Microsoft (or compatible) mouse to speed up work and increase flexibility.

The beauty of desktop publishing packages is that you need not trade in your familiar word processing (or data base or spreadsheet) program to create a finished product. Harvard Professional Publisher accepts files in ASCII or DCA data format, so text written on most popular packages will translate. While all major word processing packages convert through ASCII, PFS:Write, WordStar, and XyWrite don't offer a DCA option. Unfortunately, text saved in the ASCII format will lose bold and italic features; DCA files will retain both features.

After you've laid out a document in Publisher you can return to your word processor and make additional text edits. (This is a real advantage over PageMaker for the PC, which requires you to complete most of the editing before bringing the text into the desktop publishing program.) Don't be shocked if your text looks strange in Publisher—it's only the editing symbols and formatting tags. A formatting tag will define paragraphs, for instance, but line breaks between paragraphs will not be shown. At this stage you have free reign to make changes to both text and tags. Harvard Professional Publisher will incorporate any changes and realign the text.

Returning to your text processor, in fact, is preferable to using Harvard's limited text editor. You can't edit text directly on a document page. You must first select text you want to edit and then open an edit window. Any editing within this window is restricted to 8k. Going back into your own word processor is more efficient.

Though Harvard prides itself on best-fit justification, word spacing, and letter spacing, we found some flaws. The program does an adequate job of hyphenation. Its automatic kerning feature helps to adjust spacing between characters so they appear evenly spaced. But in our text document, those telltale signs of amateur typesetting—lengthy gaps between words, which should have been closed up—were still visible. Software Publishing claims the quality of the word spacing is dependent on the printer you are using.

Tags, which are used for a format definition, can be put in, either when first typing the text in your word processing program or later, when in Professional Publisher. For instance, if you're creating a newsletter with a headline that you want in large bold type you would indicate that through a <Head> tag (or whatever name you choose to call it). A tag is defined according to typeface and size, spacing, indents, and columns to span, where appropriate. All tags used in a particular document are stored in a format file. Special formats can be used to create special effects, such as a hanging indent, useful in a bibliography listing; or a drop cap, for the first letter of a paragraph to be in very large type. We suggest placing tags when typing; waiting to add them in Professional Publisher takes more steps and, therefore, more time.

In this program (as with PageMaker for the PC), you have to create your own page styles, since none are supplied as they are in Ventura Publisher. Creating a page style demands that you define paper size, orientation (vertical or horizontal), margins (left, right, top, and bottom), number of columns (one through six),

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(For More Information Circle 42)

headers, footers, rules, and boxes. This can be frustrating. Creating a simple page style of two columns, with a header, rule, and box demands a fair amount of time with the manual, a lot of trial and error, and careful manipulation of the mouse. (Although you can use keyboard commands, you'll find them slow going when creating a page style. If you've never used a mouse, this is the time to try.) In any document, you can vary page styles to your liking, or use the same one throughout.

You can import a variety of charts and graphic images into Harvard Professional Publisher: charts from Harvard Presentation Graphics; drawn images from PC Paintbrush; graphics from Lotus 1-2-3 (.PIC files), Dr. Halo, Microsoft Windows Paint, and PC Paint Plus; as well as photographs and line drawings from Datacopy, DEST and Compuscan scanners. Unlike Ventura or PageMaker, which directly import graphic files, Harvard requires you to convert these files, but the steps to do this are clearly set forth.

When you import graphic images, only the scale can be changed and even then the original proportions must be maintained. You can't crop an image within Harvard but must do so within the original program. You can, however, create a mask or runaround to keep text from overlapping images. You would use a mask for a graphic that conforms to the column boundaries of your page style. A runaround would be used to exclude text from an area that doesn't conform to column boundaries. When you define a mask, Harvard will automatically flow text around a graphic.

The program is directed for laser output, although you can produce a draft with a dot matrix printer. The Apple LaserWriter, LaserWriter Plus, Hewlett-Packard LaserJet, and LaserJet Plus are all supported. We used a LaserJet Series II printer with a B cartridge and were pleased with the output.

Harvard Professional Publisher works with PostScript-compatible typesetters and SuperPage II, Bestinfo's $7,000 IBM XT- or AT-compatible program that drives Allied, Compugraphic, and Varityper typesetting equipment.

Harvard Professional Publisher is definitely not a program for novices. But for those seeking a relatively sophisticated desktop publishing package, Harvard Professional Publisher is worth investigating.

—Suzanne Quigley

JC Lips Model IV's Different Processor

JC LIPS MODEL IV *is an IBM PC-compatible system with 640k of RAM, a video card, one 360k floppy disk drive, and a 21.4-megabyte hard disk plus controllers, serial and parallel ports, MS-DOS, a clock/calendar, a keyboard, and a monochrome monitor; $2,045 retail; JC Lips Information Systems Corp., 161 Whitney Place, Fremont, CA 94539; (415) 659-8440. (For more information, circle 257 on the Free Information Card.)*

In an age when it's hard to tell one IBM-compatible computer from another, the JC Lips Model IV is definitely different. Unlike most compatibles, this system uses a V40 microprocessor by NEC Electronics, Inc., instead of the more common 8088 or 8086 microprocessors made by Intel Corp.

From all appearances to the user, the NEC V40 acts like an Intel processor, and we didn't run into any software or hardware compatibility problems during the three months we used the JC Lips Model IV. In some circumstances, the V40 is actually faster than Intel's processors. The System Information command in the Norton Utilities rates the Model IV at 2.2 when it's running at 4.77MHz and 3.2 at its high speed of 8MHz. That rating uses the IBM PC as a base of 1.0. For comparison, an Epson Equity One Plus, which uses an 8088 microprocessor, scores 1.0 when it is running at 4.77MHz and 2.2 at 10MHz.

JC Information Systems is among the first companies to market computers using NEC's chips and, as far as we know, is the first to use a V40. Other systems using NEC V20 chips include those by AlphaNumeric International, Inc., Basic Time, Inc., Five Star Electronics, Nippon Electronic Technology, and Win Laboratories. Epson uses a V30 in its Equity Two. Other companies have perhaps hesitated to use NEC chips because of a drawn-out legal battle between Intel and NEC in which Intel claims that some of the V series of chips infringe on its copyrights. Late last year, a federal judge ruled that micro code is intellectual property and can be copyrighted, permitting the lawsuit to continue. He did not rule on the issue of infringement, but permitted the lawsuit to continue to settle that question.

JC Information Systems markets a full range of IBM-compatible personal computers, all of them competitive. Prices for the Lips series start at $795 for the Model I base unit, a 256k single-floppy system without MS-DOS, a monitor, or a display card. The base Model II ($995) adds a video display card, the Model III ($1,145) comes with a second floppy disk drive, and the base Model IV ($1,645) adds a hard disk with controller. The formatted capacity of the hard disk is 21.4 megabytes. Our review machine retails for $2,095—it came with 640k of RAM, MS-DOS, and a monochrome monitor.

Other options available include multimode video cards, network cards, color monitors, and larger hard disks. The company also sells the JC Lips III/286, an AT-compatible, with prices starting at $1,695.

The Model IV has eight expansion slots. There's also a lock and key for users who want to keep others away from their computers.

Memory is tested when the unit is turned on. The system comes with a utility program that includes configuration information, and tests of memory, ports, floppy disks, and local-area network connections. You also can reset the date and time with the utility program. The hard disk systems also have an additional utility program used for formatting and diagnostics. It is unfortunate that neither of these utility programs lets users toggle between the two system speeds of 4.77- and 8MHz. Instead, you must change the speed by pressing Shift-Control-NumLock, which is hardly intuitive or easy to remember.

Although the keyboard is described as "AT style," it is not the IBM PC AT-enhanced style. Function keys are on the left side, not across the top, and the escape key is above the numeric keypad, not on the upper-left side of the keyboard. Some users prefer this older style of keyboard for applications, such as WordPerfect, that require intensive use of function keys.

We found no indications of compatibility problems. The NEC V40 chip, in fact, acts like a super-set of its Intel competitors, often offering faster processing in addition to compatibility. Once the legal fight between NEC and Intel is settled, we wouldn't be surprised to see many more MS-DOS machines using NEC chips. NEC claims that it developed the V series of chips independently and didn't infringe on Intel's copyrights. But even if Intel wins the lawsuit, speculation is that NEC probably could continue to sell its versions of the microprocessors, paying royalties to Intel.

—Sandra R. Reed

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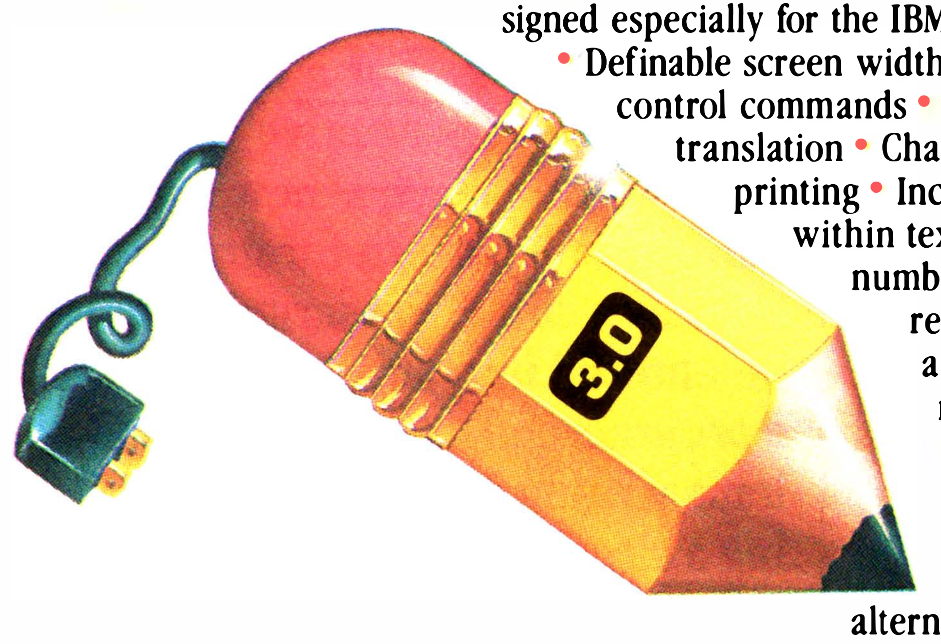

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(For More Information Circle 123)

Kyocera F-2010: 7 Printers In 1

THE F-2010 COMPACT LASER PRINTER *comes with 1.5 megabytes of RAM, parallel and serial ports, two paper trays and cassettes, 36 resident fonts, and the proprietary Prescribe programming language; it emulates six other printers; $4,695 retail; Kyocera Unison, Inc., 3165 Adeline St., Berkeley, CA 94703; (415) 848-6680. (For more information, circle 254 on one of the Free Information Cards.)*

Most printers befuddle me. The loathsome dip switches, thoughtlessly placed ports, cantankerous ribbons, and incredibly sensitive tractor feeds of dot matrix and daisy wheel printers seem designed to test my stamina.

So I say hallelujah for laser printers in general and for the Kyocera F-2010 in particular. This is a printer with which I can live happily ever after. Not only are all the F-2010's controls right there on its front panel, but it also emulates—without dip switches—six other printers: the Epson FX-80, HP LaserJet Plus, Diablo 630, Qume Sprint II line printer, NEC Spinwriter, and IBM PC Graphics Printer.

The F-2010 is Kyocera's second laser. The F-1010, which costs $1,200 less, also prints at 300 dots per inch and emulates the six other printers, but it's less versatile. The newer model, for instance, has two paper trays and two stackers, one for face-up and one for face-down delivery of printed documents. And there's an optional $600 sorter that sorts up to five copies of a 25-page document.

The most attractive feature of the F-2010 is its control panel, which is dramatically better than the F-1010's front panel. You can invoke virtually every printer feature with the new control panel, from setting RS-232C parameters to setting printer emulation to setting the number of copies (up to 99). When you have the printer off-line, pushing the Status button generates a page of information detailing settings like margins, line and character spacing, memory allocation, and country codes. The nine country codes make non-English character sets available, such as those using tildes or umlauts. Additional international flavor comes from the fact that you can choose any of seven languages for the messages displayed on the panel's LCD status screen.

Of the 36 built-in fonts, 16 are portrait (the usual way of printing) and 20 are landscape (sideways). You can vary type sizes from 6 to 14.4 point in fonts that include Courier, Helvetica, Times Roman, Gothic, and Elite. Kyocera assigned each font a number, making it easy to change fonts by punching your choice into the numeric keypad on the panel.

To the left of the LCD screen, symbols and lights indicate whether the printer is on- or off-line, when it needs more paper, if a paper jam has occurred, or if it needs service, like adding toner.

Kyocera intended the F-2010 for fairly heavy use. It prints 10 pages a minute (that's two pages a minute faster than the LaserJet Plus) and requires less than 30 seconds to warm up. Its maximum noise level of 55 decibels means you don't have to hold all telephone calls while printing. It comes with two letter-size paper trays on the theory that most users will want plain paper in one and letterhead in the second. Also available are 250-page trays for legal-size, A4 (210 by 297 millimeters), and B5 (182 by 257mm) paper. You can feed envelopes, overhead projection film, colored paper, and adhesive-backed labels into the printer manually.

Many laser printers use an engine made either by Canon (LaserJet and LaserWriter) or Ricoh (Quadram and Digital Equipment Corp.) The F-2010 has a Kyocera-designed engine. Unlike some competing products, the toner cartridge and drum are separate, so you don't have to throw out a drum merely because you're out of toner. The toner needs to be replaced every 3,000 pages, the drum every 10,000, and the developer every 50,000. At 80,000 pages, you have to take the machine to a dealer to replace the unit that fuses the toner onto paper.

Most users will be happy with the basic design of seven printers in one. Those who need more than that, however, can make use of two of the F-2010's unusual features: IC card slots and a programming language. Other vendors make the cards, which contain integrated circuits on which you'll find elements like logos, forms, or even more fonts. The F-2010 provides slots for two IC cards; the printer loads their contents into memory when you turn it on.

The F-2010 comes with two manuals: a users manual and a programming manual. The programming manual tells you about Prescribe, the proprietary language that lets you create your own fonts, draw graphics without a graphics program, and print bar codes. For a programming language, it's semi-intuitive with commands like PAGE to start a new page, FPAT to choose a fill pattern for graphics, and CIR to draw a circle. Prescribe commands can be entered into any document; !R! starts a program and EXIT; ends it. I had no problems writing simple programs (like drawing a circle in the middle of a page) once I figured out you must enter commands in upper case.

Although the F-2010 emulates other printers, it is missing one capability—support for the Postscript page description language. Kyocera initially said that Postscript wasn't necessary because of the emulation capabilities and availability of Prescribe. After IBM and HP announced that their printers will use Postscript, though, Kyocera officials said that they were looking to implement Postscript, either with the F-2010 or another printer.

—Sandra R. Reed

KYOCERA
IC CARD
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Controls for Kyocera's F-2010 laser printer are on the front panel for easy access.

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(See Catalog Information below for details)

EasyPRINT—New *Easy* Solutions to Printer Sharing from $79.98 to $149.98 per PC.

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PC Magazine in 1985 profiled the ideal printer sharing system. We compared their wish-list against *EasyPRINT,* and here's how we stack up:

PC Magazine Profile	***EasyPRINT***
▪ Hook up any number of PCs to a printer.	Yes
▪ Support your choice of:	
Letter Quality	Yes
Dot Matrix	Yes
Laser	Yes
Plotter	Yes
▪ Large segmented print buffer.	Yes
▪ Accept all incoming print jobs no matter if the printer is busy.	Yes
▪ Support mixed serial and parallel devices.	Yes
▪ Any 3–4 users should be able to justify a joint purchase of all three printer types.	Yes

Highlights

- Expandable—from 2–25 PCs
- Supports serial and/or parallel printers in any combination
- Totally automatic
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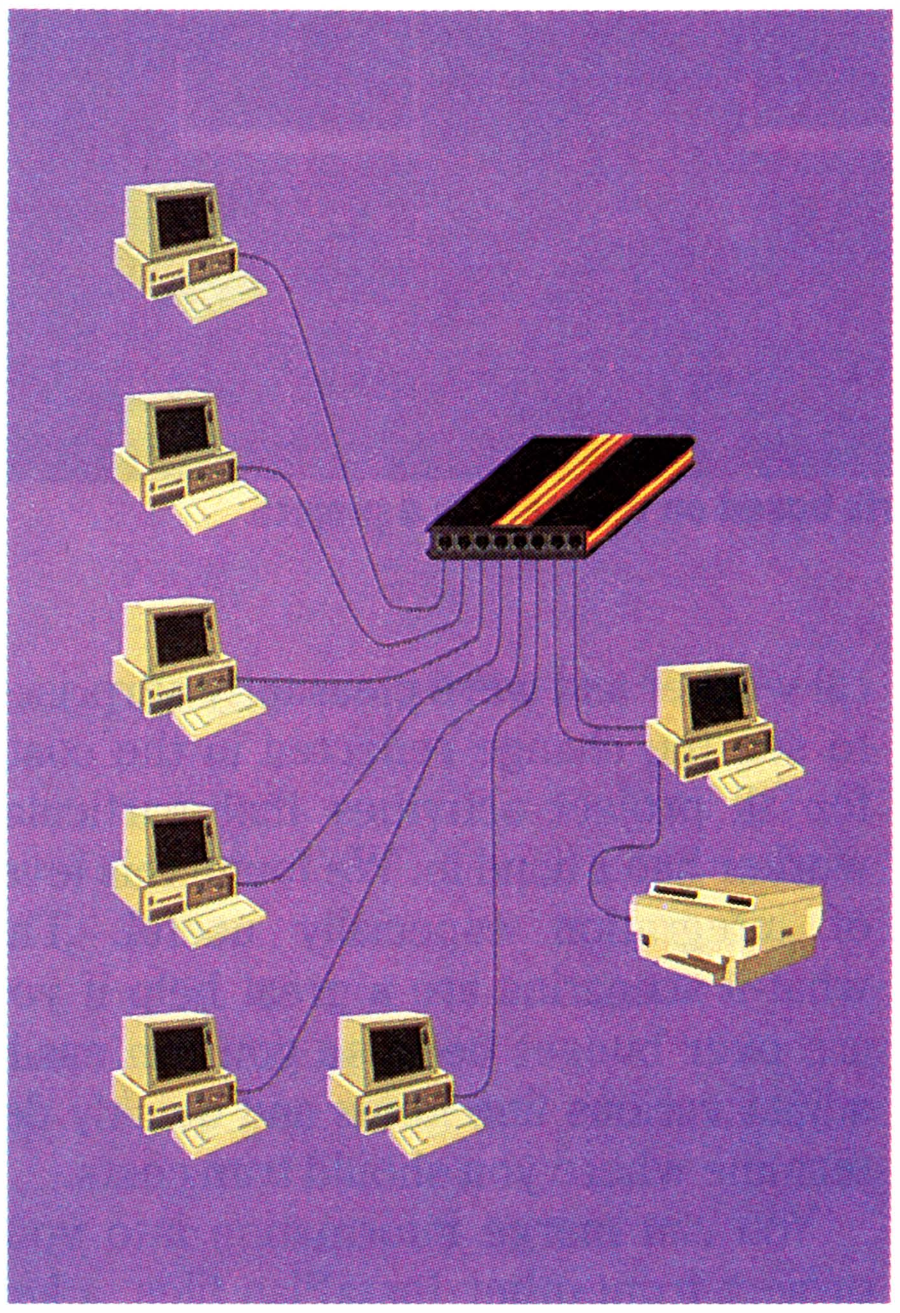
(For More Information Circle 15)

> ***"Best bargain."***
> —*PC Magazine*, April 28, 1987



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EP-700	*EasyPRINT* for 7-PCs. With CrossPOINT switch and *EasyPRINT* software.	$ 899.95	___	$ ______
EP-750	*EasyPRINT* for 7-PCs. With CrossPOINT Switch and Print-Q® software.	$ 999.95	___	$ ______
EP-800	*EasyPRINT* for 8-PCs. With CrossPOINT Switch and special *EasyLAN* software.	$1199.95	___	$ ______

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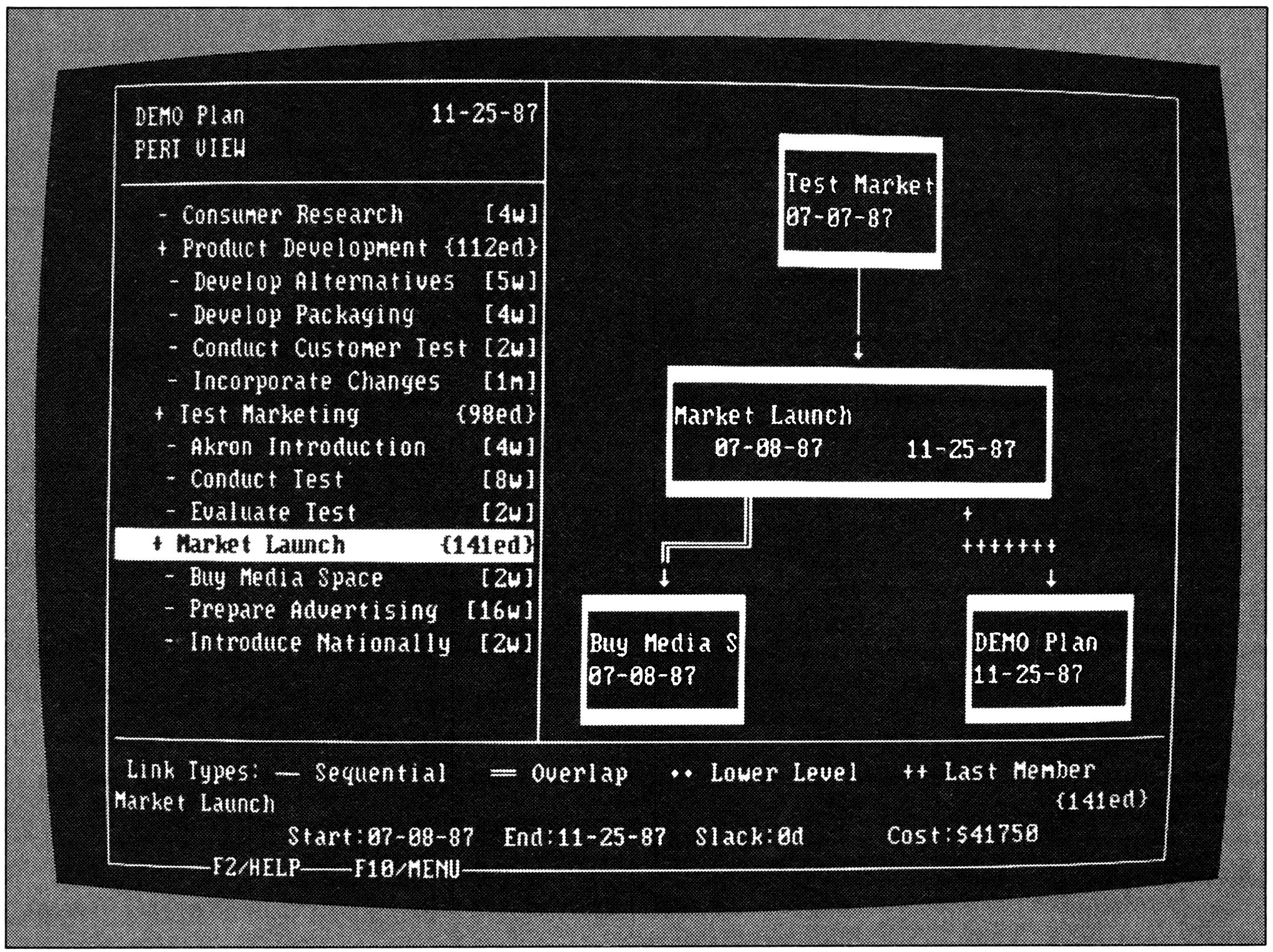

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DEMO Plan                 11-25-87
PERT VIEW

  - Consumer Research         [4w]
  + Product Development {112ed}
   - Develop Alternatives  [5w]
   - Develop Packaging     [4w]
   - Conduct Customer Test [2w]
   - Incorporate Changes   [1m]
  + Test Marketing         {98ed}
   - Akron Introduction    [4w]
   - Conduct Test          [8w]
   - Evaluate Test         [2w]
  + Market Launch         {141ed}
   - Buy Media Space       [2w]
   - Prepare Advertising  [16w]
   - Introduce Nationally  [2w]

Link Types: — Sequential   ═ Overlap   •• Lower Level   ++ Last Member
Market Launch                                                  {141ed}
         Start:07-08-87  End:11-25-87  Slack:0d      Cost:$41750
——F2/HELP——F10/MENU——
```

InstaPlan automatically creates PERT or Gantt charts based on the steps in a project.

Help For Project Management

INSTAPLAN *runs on the IBM PC, XT, AT, or compatibles and requires 640k of RAM (hard disk recommended), not copy protected; $99 ($149 with Tracker option) retail; InstaPlan Corporation, 655 Redwood Highway, Suite 311, Mill Valley, CA 94941; (415) 389-1414. (For more information, circle 260 on one of the Free Information Cards.)*

The term *project* management belies the sometimes confusing and overlapping activities involved in a project, such as developing a strategy, allocating manpower, budgeting, setting a timetable, and tracking all of these activities as they move toward completion. InstaPlan is an inexpensive tool for handling things in an orderly fashion.

InstaPlan groups project information by clearly defined formats, or views. In one view, for example, you might list the steps needed to complete a project and the amount of time each step should take. In a second view, you would list all the workers needed to complete the project, what aspect of the project each will work on, and how much time this will take, as well as the hourly, daily, weekly, or monthly salaries of these employees. A third view displays the cost of each of the project's steps.

To see how these might be of use, we changed the hourly wage of a hypothetical worker and were pleasantly surprised to see the change reflected in the costs for all project activities that particular worker had a hand in. We found this level of integration especially useful. The what-if scenarios are a great help if you are over budget because you can easily adjust various line items and quickly determine where you should trim costs.

You can merge information into your project from other InstaPlan files, a key feature if a current project requires some of the same information found in a past project. You can also import or export word processing files in ASCII format. Importing files is of limited value because you probably won't have much information stored in word processing files needed for project management. Exporting InstaPlan files to a word processor, however, is convenient if you want to include project facts in a report or memo. You can transfer information from InstaPlan into Lotus 1-2-3 or dBase III but can't import information from your spreadsheet or data base files into InstaPlan, a serious drawback since it's probable you will have relevant financial or employee information in these applications.

Staying on time and on budget are two goals of project management. InstaPlan's "tracker" option helps you do this by comparing the status of a project in progress to its forecast. InstaPlan's tracker module adds $50 to the program's cost , but it's worth it because the "tracker" shows at a glance whether you are behind or ahead of schedule, and automatically highlights cost overruns.

While you may be the project manager, you will have to get the project approved by, and give periodic updates to, your boss. InstaPlan enables you to print information in bar, Gantt, or PERT charts and to develop a spreadsheet-type view of the steps needed to complete the project, listing the starting and ending dates, and the dollars budgeted for each step. Charts printed with "tracker" show the project's status as well as the original forecast. Unfortunately, however, the program does not support plotters or color printers. The charts, eye-catching already, would be more so in color. Among the printers InstaPlan supports are the IBM Proprinter, Epson FX, MX, RX, and LQ lines, Okidata's Microline 192/3 and 292/3, Toshiba 351, and the HP LaserJet Plus.

Our one gripe with InstaPlan is its manual. It discusses various aspects of the program at length but rarely gives a concise description of how to use these aspects. For example, one portion of the manual repeatedly defines an independent activity and concludes by stating, "One of InstaPlan's Schedule command options lets you label an activity 'independent.' " Was it too much trouble to mention which Schedule command option we should use? The manual has both grammatical and spelling errors. And at the end of one section the manual states that a certain command is discussed "in detail" in chapter three, section six. But chapter three ends after section five without further discussion of the command.

Fortunately, InstaPlan uses a Lotus 1-2-3-style command menu across the bottom of the screen that is easy to get the hang of. In addition, help is available at any time. The help screens are informative and clearly written. We made our best progress by putting the manual aside and simply exploring the menu and reading the help screens whenever we were confused. A bug in earlier InstaPlan versions caused the screen to go blank on certain computers when a user exited the program. We experienced this problem with version 1.1 on Kaypro's new 386 computer but had no problem working with the current version 1.02.

If your present method of project management works fine, stick with it. But if you're looking for something different, consider InstaPlan. It brings order, integration and flexibility to the job.

—Patrick Honan

New Version 3.0 with
- New Network Commands
- NETBIOS Support

EasyLAN—Networking With Netbios Support. And it's Only $99.95 Per PC.

If you own two or more PCs then you need *EasyLAN*™ version 3.0.

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EasyLAN shares printers and disk drives between IBM PCs. *EasyLAN* can save you $1,000 or more per PC by eliminating duplicate equipment purchases.

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EasyLAN VERSION 3.0 HIGHLIGHTS

- ***EasyLAN* shares printers, plotters, data, and disk storage**
- **Supports up to 18 PCs or compatibles**
- **New Network Commands**
- **New NETBIOS**
- **PC to PC file transfer**
- **Print spooling**
- **PBX support**
- **Easy to install**
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- **Modem support**
- **Performs in the background**

EasyLAN's low price matches the small business user's cost-sensitive budget. It is the office network solution for less than $100 per PC.

EasyLAN performs its operations concurrently in the background. *EasyLAN* communications, file transfers and printer operations all take place while each PC simultaneously performs such normal DOS applications as Lotus 1-2-3,™ Wordstar,™ and dBASE.™

NEW NETBIOS SUPPORT—WRITE YOUR OWN COMMUNICATIONS PROGRAMS.

Programmers may use *EasyLAN* to develop network applications using NETBIOS (interrupt 5c). These applications can now be operated across the low-cost RS-232 communications links used by *EasyLAN*. Our new *EasyCALENDAR* program is an example of a network application that uses NETBIOS for program-to-program communications.

Multi-user data-base management applications that require a high-overhead network operating system will perform faster on high-cost networks operating at megabit speeds.

NEW VERSION 3.0 COMMANDS EXPAND NETWORK FLEXIBILITY

EZCLOCK lets PC's attached to the network read the time and date from a single master clock on the central PC, eliminating the need to install individual clock boards in each PC and insuring that all file entries and updates made across the network are dated.

The EZ Make Directory and EZ Remove Directory commands function identically to the DOS MKDIR and RMDIR commands, and give remote users increased flexibility when it comes to managing subdirectories on the central PC.

EZBEEP lets you send an audible signal across the network, alerting a PC user that a file or message is being sent.

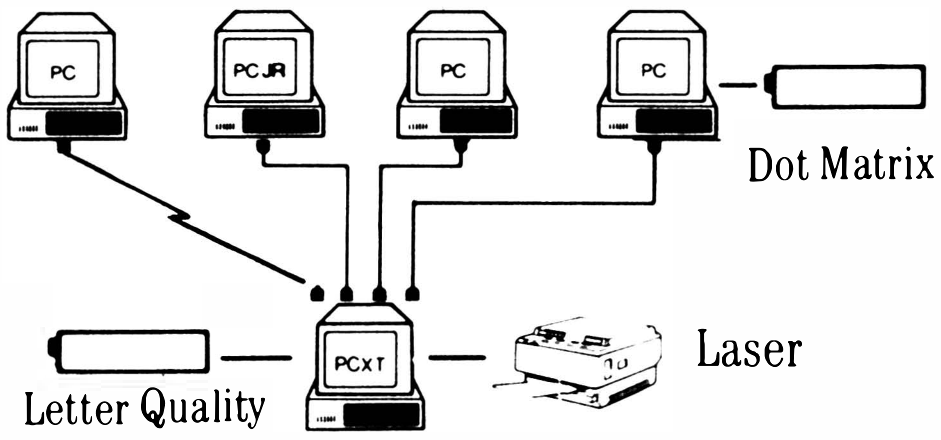
EasyLAN PBX SUPPORT BRINGS NEW FLEXIBILITY TO PC CONNECTIVITY

With *EasyLAN's* PBX support, users can share peripherals and transfer files using PBX switched-circuit connections and existing twisted-pair wiring. *EasyLAN* has already been installed on a number of different PBX's, and recently was certified by Northern Telecom for use on its Meridian SL-1.

> *"The value is high* 🖥 🖥 🖥 🖥 *"*
>
> **—InfoWorld Report Card**

Disk sharing uses *EasyLAN's* EZCOPY command to move files to and from PC's. ASCII or binary files can be transferred in the foreground, or in the background while other DOS programs run.

Printer sharing operates transparently with existing programs. Print files are automatically spooled to disk and scheduled for printing. Multiple printers on the central PC may be designated for individual printing tasks.



***EasyLAN* Office Network**

EasyLAN SPECIFICATIONS

Each PC in the network requires an individual licensed copy of the *EasyLAN* program and takes 20k of memory on each satellite PC, a serial port, and DOS 2.0 or above. *EasyLAN* runs on all IBM PC models and compatibles. The central PC requires a serial port for each satellite PC. The COM2 and COM6 boards are serial port expansion boards which permit you to add serial ports to the central PC.

EASY TO INSTALL

EasyLAN can be installed in less time than it takes to enjoy your coffee break. Just plug the *EasyLAN* cables into existing serial ports. The *EasyLAN* Network Configuration Program provides menu driven installation program that will guide you step-by-step through the software installation process.

EasyCALENDAR—USE YOUR NETWORK TO SCHEDULE MEETINGS.

The first of a new series of *Easy* network application products using NETBIOS is now available. *EasyCALENDAR* handles time management applications for individuals or a department and can be run on personal computers attached to any NETBIOS-compatible network.

Highlights:

CALENDAR MANAGEMENT for individuals and the work group.

TASK MANAGEMENT to create, maintain and review to-do lists.

TODAY'S NEWS for broadcasting messages, notices or announcements across the network.

MENU INTERFACE for easy set-up and use.

EasyCALENDAR's Data base for appointments, to-do lists and news resides on the central PC. Satellite PCs attached through *EasyLAN* version 3.0 send network transactions to the central data base to invoke *EasyCALENDAR* functions.

The *EasyCALENDAR* calendaring program requires *EasyLAN* version 3.0 and is priced separately.

EasyCALENDAR will be available March 1987. Advance orders are being accepted now.

> *"I bought access to a laser jet printer for less than $100."*
>
> **—CONOCO Oil User**

EasyLAN

(For More Information Circle 16)

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Item	Description	Price	Qty	Amount
EL 02	*EasyLAN* Kit—for 2 PCs 30′ cable, two disks & manuals	$219.95	____	$ ______
EL 03	*EasyLAN* Expansion Kit—for 1-PC 30′ cable, one disk & manual	$119.95	____	$ ______
EL 10	*EasyLAN* disk & manual (3¼″ disk $109.95)	$ 99.95	____	$ ______
EL 12	*EasyLAN* 30′ cable	$ 49.95	____	$ ______
EL 13	COM2-serial port expansion board, two ports	$219.95	____	$ ______
EL 14	COM6-serial port expansion board, six ports	$489.95	____	$ ______
EC 01	*Easy CALENDAR* Kit Supports 6-PC's and 10 people	$199.95	____	$ ______
EL 15	Custom length cables, call for quote			
	CA res. add applicable sales tax			$ ______
	Shipping charge USA $10.00, other $20.00			$ ______
	TOTAL ORDER			$ ______

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(For More Information Circle 202)

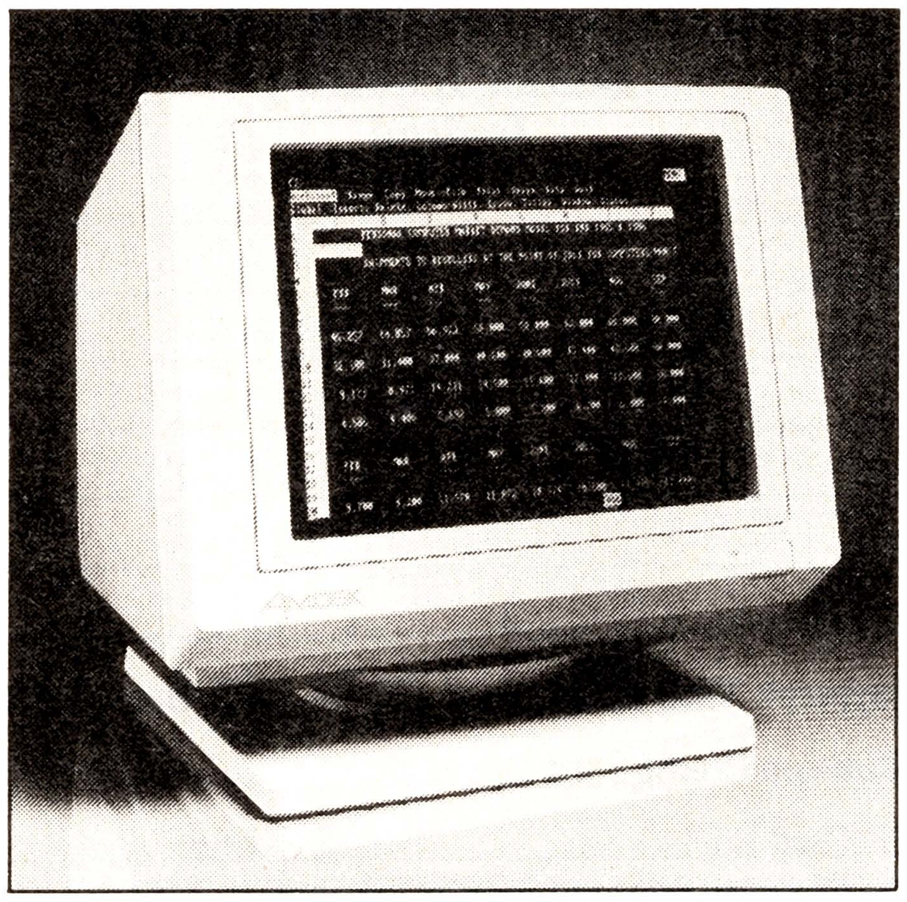
Flat And White

AMDEK 410 *is a monochrome display for use with IBM or compatible personal computers; an IBM or Hercules (or compatible) monochrome display card is required; $195 retail; Amdek Corp., 1901 Zanker Road, San Jose, CA 95122; (408) 436-8570; (For more information, circle 256 on the Free Information Card.)*

For those of us more concerned with the clarity of text than with the color of graphics, it is encouraging to see new and innovative approaches to monochrome displays. Amdek's 410 monitor, while offering resolution equivalent to standard monochrome displays, strides forward in two areas: screen shape and, oddly enough, color.

The Amdek 410 monitor is a "flat screen" display, meaning the surface of the cathode-ray tube (CRT)—the part you see—is not rounded and recessed at the corners as most monitors are. (It is a 12-inch, conventional display, however, not a flat screen in the portable computer sense.) Does that revelation leave you, well, flat? It shouldn't. Flat screens with square corners all but eliminate distortion along the fringes of the screen, a frequent shortcoming on regular monitors with curved glass surfaces. With a flat screen, you get as sharp an image at the corners as you do at the center, which is why so many televisions now use such a CRT themselves.

A flatter screen, for all its technical superiority, may be of dubious advantage if you employ it only for displaying characters. Word processing software tends to frame the screen anyway, keeping text in the middle of the screen and away from edges and corners. Still, we observed a crisper, more level appearance overall, and the 410 unquestionably straightens out monochrome graphics.



Flat screens, like Amdek's 410, keep text and graphics undistorted at the screen's edge.

The 410 is not a color monitor, but you can purchase a unit in any of three colors: green, amber, or white. Yes, white. Our review model employed the white phosphor and quickly made an admirer of a cynic. This is *true* white, not the clumsy mix of primary colors used to produce the pinkish white characters of CGA and EGA color monitors. And what a difference it makes. Though this true white takes a little getting accustomed to (first reaction: it's like looking at the negative of a newspaper), the sharp contrast of pure white on pure black is visually refreshing. It is so sharp, in fact, that you can dim the screen considerably—giving your eyes a bit of a break—and still clearly see what's there.

Not feeling terribly adventurous? The green and amber versions of the 410 we glimpsed in stores appeared to be top-notch as well. This business of color is very subjective; look before you leap.

Text on the Amdek 410 seems no more nor less crisp than that on the IBM original monochrome display, which is to say it is very readable but nothing new. Graphics, if you're using a Hercules monochrome graphics card or a compatible board, are clean and sharp (though only in one color, of course). The non-glare nylon mesh screen covering the face of the display is designed to diffuse unwanted light; it helps, but it does not eliminate the glare problem, a problem with a great many monitors.

Our beefs with the 410 are relatively minor and may be limited to the review model. Its rows of characters (and its images) were slightly skewed to the right—slanting is a common defect but it must be fixed by a technician. Our 410 was apparently sensitive to interference, too. Atop one computer, text got a mild case of the shakes. Elevated or placed beside the computer, however, it was fine. Amdek's good reputation and its solid warranty (two years parts and labor), leave us confident any such idiosyncrasies will be ironed out.

One other caveat: the 410 has a cupped AC plug that fits into the outlet on the rear panel of IBM machines and many compatibles. If your computer has no such outlet, you'll have to buy a regular power cord so you can plug the monitor into the wall.

Amdek's 410 is above average in styling, below average in size, and about average in price. Best of all, it's easy to read and nearly distortion free. It may be time for a mono upgrade.

—*Christopher O'Malley*

On April 2, 1987 IBM and Quarterdeck announced the next generation in personal computing.

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(For More Information Circle 87)

An Inexpensive Word Processor

CELEBRITY 1.0 *is a word processing program that requires 256k of RAM and MS-DOS 2.0 or later; not copy protected; $89.95 retail; Good Software Corp., 5429 LBJ Freeway, Suite 720, Dallas, TX 75240; (214) 239-6085. (For more information, circle 253 on one of the Free Information Cards.)*

There's more to Celebrity, an inexpensive word processing program, than you'd normally expect from a software package that costs less than $100. Not only does Celebrity include standard word processing features such as a spelling checker and thesaurus but Good Software has included accessories (a calendar and a calculator) which are usually available from add-on utility programs.

Celebrity provides access to both a command line (on the bottom of the screen) on which you enter a command and to an optionally displayed menu of commands from which you can make the requisite selections. The menus are similar to those in Lotus 1-2-3, in which the selection of a command transports you to yet another menu. The menus are accessed and called onto the screen by hitting the PrtSc key and exited via the escape key. This manner of selecting commands is especially useful for beginners.

When a user is comfortable with the program's commands, he or she can skip the menu selection and enter commands directly onto the command line. It's useful, however, to have the option of the menu selections. Function keys (alone and in conjunction with the control and Alt keys) are a third option for activating commands, although not all of the program's commands are available using the function keys. It is our impression that the commands tied to specific function keys are logically defined and easy to remember. That's helpful since Good Software does not include a function-key overlay that explains the commands. And although Celebrity does include a help module, it is not context-sensitive.

The program enables users to divide the screen into as many as four windows, making it possible to view more than one file (or two versions of the same file) at a time and to zoom in and out of various files. Celebrity also makes it simple for users to define blocks of text (a word, a line, a sentence, or a column) by pressing the corresponding function key (F1 to block the previous word, F2 for the next word, F3 for the previous line, etc.). Users also have the option of entering blocking instructions on the command line or through menu selections. It's possible to reformat any highlighted block of text with commands for left or right justification, centering, and so on. The program's windowing feature enables you to move blocks of text between windows using Celebrity's Move command.

The program's 80,000-word Merriam-Webster dictionary and 40,000-word thesaurus (which were both purchased from Proximity Technology) appear in the right half of the screen. Users can access the dictionary and thesaurus in any of three ways: via function keys, command-line instructions, and menu selections.

Celebrity includes Forms and Reports modules that provide a mini-data base enabling users to catalog addresses and phone numbers that can later be entered onto documents or mailing labels. Even though the current Forms and Reports modules are not difficult to use, Good Software says that it plans to combine Forms and Reports into a single module in an updated release.

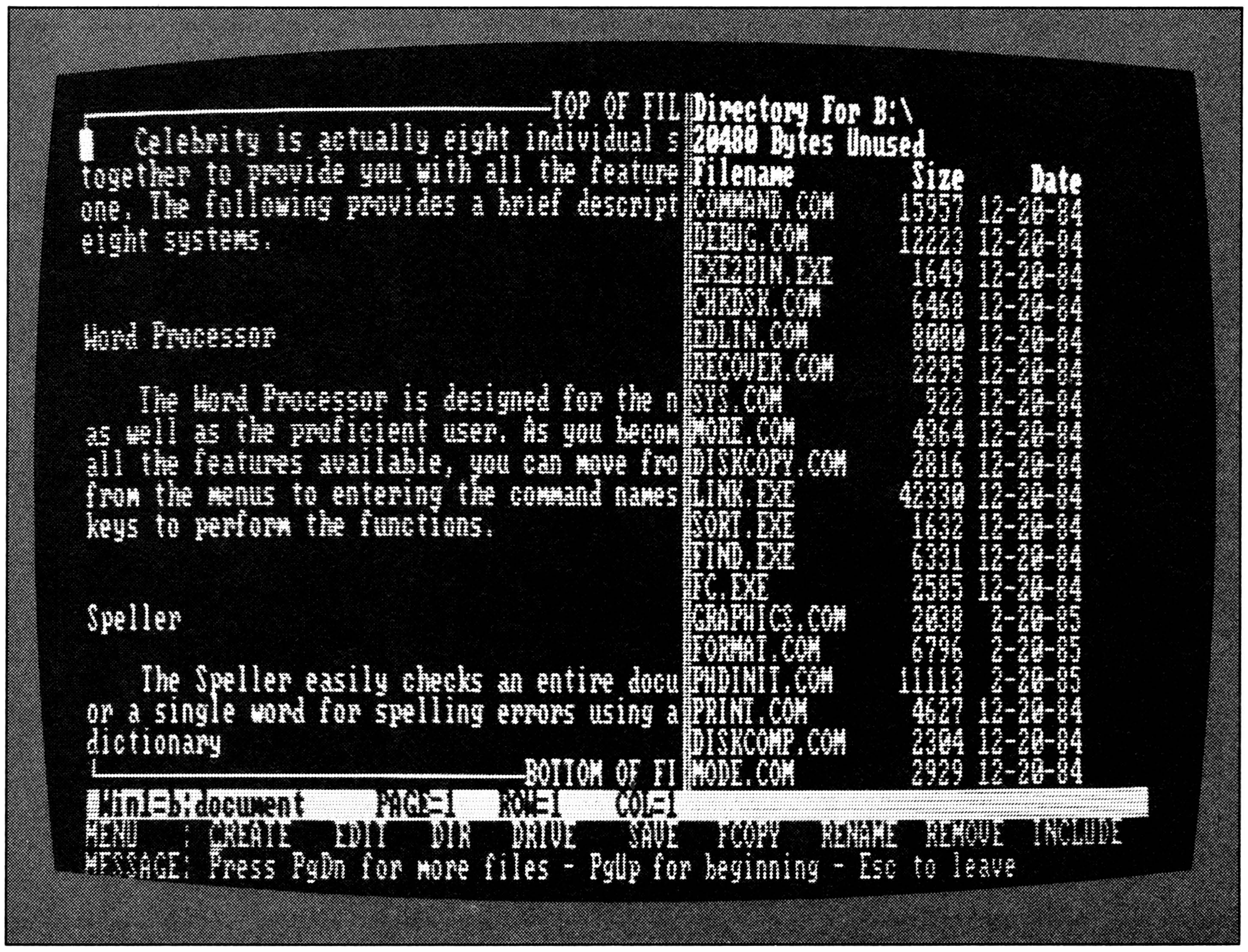
The program's pop-up calculator, which is entered into by hitting F7, entering "calculator" on the command line, or making a menu selection, offers users advanced business functions (annuities, loans, net present value, and internal rate of return), and scientific capabilities (including sine, arcsine, cosine, arccosine, pi, and logarithmic). Values generated by the calculator can be entered into a document with a single keystroke ("I"). Celebrity's calendar accessory (accessed by keying in "calendar" on the command line, F8, or a menu selection) will generate printouts of daily, weekly, or monthly appointments, when "print" is selected from the menu.

The hard disk installation creates a subdirectory in which Celebrity catalogs data files and program files. (It's likely that you'll want to create an additional subdirectory to contain personal data files.) Shifting between the default drive and the directory from within the program is a simple exercise attained either by entering instructions on the command line or making a menu selection. The program addresses file maintenance for floppy systems in its File Cabinet feature; you can create printouts of file name, size, date and time of modification, subject, and "addressee" on a hard or a floppy disk.

It is easy to create temporary (RAM-resident) macros with Celebrity but troublesome to save them. The manual is not clear in its description of special command files in which to type the macros, and you have to be sure to include those files in the default directory specified.

Celebrity may not have all the features of its more expensive word processing cousins, such as automatic footnotes, an outline module, a table of contents generator, or provisions for converting files from other programs, but for $89.95 it is more than a cheap imitation. You may even discover that Celebrity is the only word processor you need.

—*Stephanie Makrias*



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together to provide you with all the feature│Filename        Size    Date
one. The following provides a brief descript│COMMAND.COM    15957 12-20-84
eight systems.                              │DEBUG.COM      12223 12-20-84
                                            │EXE2BIN.EXE     1649 12-20-84
                                            │CHKDSK.COM      6468 12-20-84
Word Processor                              │EDLIN.COM       8080 12-20-84
                                            │RECOVER.COM     2295 12-20-84
   The Word Processor is designed for the n│SYS.COM          922 12-20-84
as well as the proficient user. As you becom│MORE.COM        4364 12-20-84
all the features available, you can move fro│DISKCOPY.COM    2816 12-20-84
from the menus to entering the command names│LINK.EXE       42330 12-20-84
keys to perform the functions.              │SORT.EXE        1632 12-20-84
                                            │FIND.EXE        6331 12-20-84
                                            │FC.EXE          2585 12-20-84
Speller                                     │GRAPHICS.COM    2038  2-20-85
                                            │FORMAT.COM      6796  2-20-85
   The Speller easily checks an entire docu│PHDINIT.COM    11113  2-20-85
or a single word for spelling errors using a│PRINT.COM       4627 12-20-84
dictionary                                  │DISKCOMP.COM    2304 12-20-84
└──────────────────────────BOTTOM OF FI│MODE.COM        2929 12-20-84
Win1=b:document     PAGE=1     ROW=1     COL=1
MENU   : CREATE   EDIT   DIR   DRIVE   SAVE   FCOPY   RENAME   REMOVE   INCLUDE
MESSAGE: Press PgDn for more files - PgUp for beginning - Esc to leave
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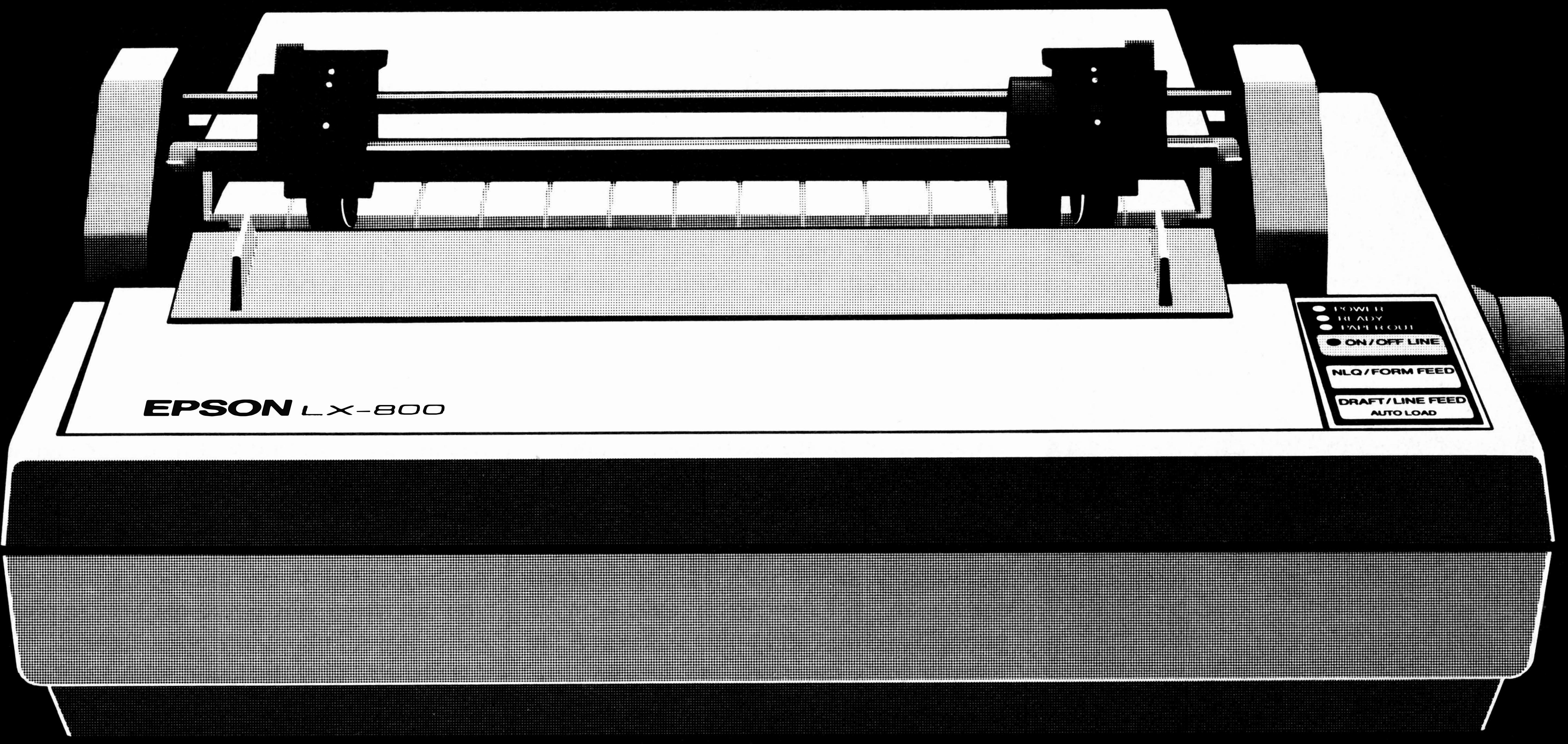
The Directory command brings the disk directory onto the screen in a separate window.

It's more than fast and inexpensive.



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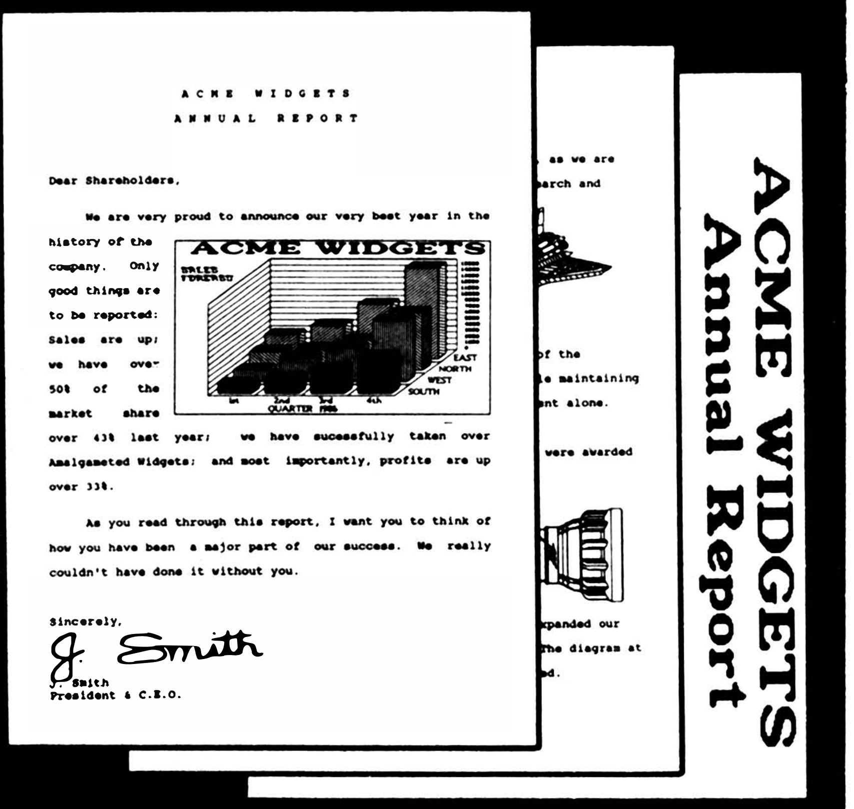

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J. Smith
President & C.E.O.

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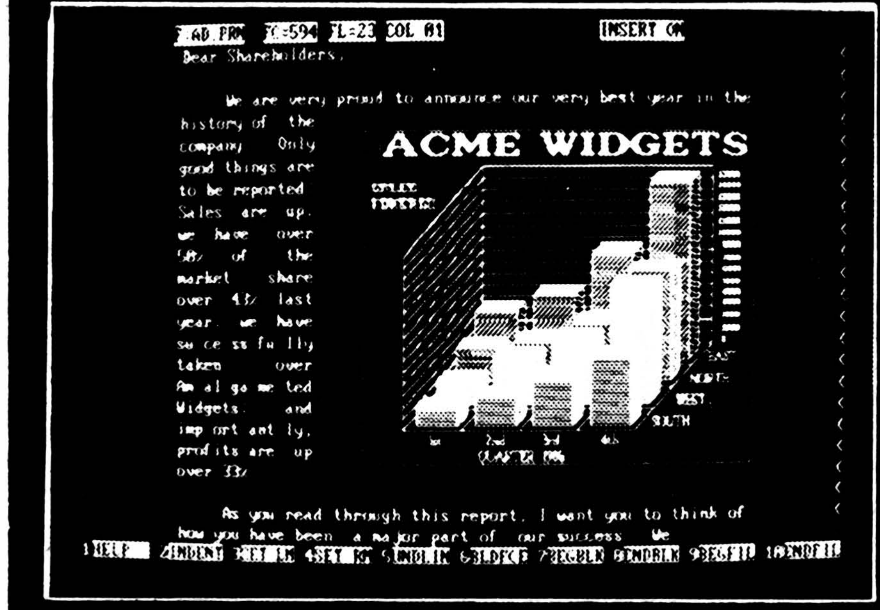

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(For More Information Circle 188)

PRODUCT REVIEWS

A RAM-Hungry Partner

PARTNER PC *is a RAM-resident set of utilities designed for use with DOS applications; it requires a minimum of 237k of additional RAM to load all utilities; not copy protected; $59.95 retail; Timeworks Inc., 444 Lake Cook Road, Deerfield, IL 60015; (312) 948-9200. (For more information, circle 252 on one of the Free Information Cards.)*

In the fight for the hearts of users of RAM-resident desktop accessories, new contenders are appearing to challenge the reigning champion, Borland's SideKick. The newest competitor, Partner PC from Timeworks, packs 10 functions, but can it compete with SideKick and fend off that other contender, Lotus Metro? The odds are even.

Partner PC enters the bout with a serious handicap. While SideKick needs a lean 55k of memory and Metro requires a trim 80k, Partner PC weighs in at a minimum of 150k and can take up as much as a whopping 219k. Decreasing the memory requirement means shedding functions.

If you opt to load Partner PC in its entirety, all the functions you expect in a desktop accessory package are available, including a memo pad, an appointment scheduler, a calendar, a calculator, a phone directory, and a phone dialer. All of Partner PC's functions can be run from DOS or triggered from within an application with Alt-key combinations. These "invocation keys" may be changed by altering the AUTOEXEC.BAT file.

Yet Partner PC provides functions SideKick (the MS-DOS version) lacks, including a financial calculator, access to DOS commands, an alarm function, and a window to run another program without disrupting your current application.

The windows function, which Timeworks calls Power Windows, enables you to set aside a portion of memory to run other programs. This memory is above and beyond the 219k needed to load the entire Partner PC. When you invoke Power Windows, your current application is suspended and a DOS prompt appears on the screen. You may switch to another directory, run a program, and perform any action that you would normally do from a DOS prompt. The other Partner PC accessories are still available.

Combining Power Windows with the Memo Pad provides tremendous flexibility in moving data between two programs. For example, you could be using a word processor to write a report, switch to a spreadsheet, grab a row of numbers using the Memo Pad, and then dump the numbers into the word processor. The only drawback to the process is that you cannot keep the second application running—you must exit the application running under Power Windows before you reenter your current application.

Another handy function is the Alarm Clock, which enables you to set up to six alarms per day to remind you of important engagements. When the time you set matches the time on the system clock, the accessory sounds a tone and displays a message on-screen. Alarm Clock also includes a stopwatch in case you want to time an event. In addition, the accessory has a "timed feed" option to send commands to DOS at a specific time, a boon to those who want their PC to work overtime without having to stay around.

The overall integration of all functions is well done. Exchanging information between accessories, as well as between an application and an accessory, takes time to master, but once learned, is fast and convenient. The calculator proves to be the most cantankerous accessory for trading data, forcing you to go through a complicated process in placing the numbers where you want them. With enough patience, trial and error, and a careful reading of the documentation, however, you can eventually figure out how to plug calculator numbers into applications.

Partner PC is designed with the first-time user in mind and includes a multitude of prompts and error-trapping features that provide foolproof operation.

The biggest drawback to Partner PC is its size—roughly three times that of SideKick and twice that of Metro. Running your regular application, DOS, and all the accessories leaves precious little memory. You can also forget about opening a window of any size. You could, of course, *not* load the financial calculator, the access to DOS, and the Power Window, but do you know what you'd get? A 150k version of SideKick with an Alarm Clock.

However, Partner PC's retail price is almost half that of SideKick, though the difference in price decreases if you purchase SideKick through a mail order company. The larger size means that you do get more functions than SideKick offers, though not many more than Metro does.

So if you've got memory to burn, the lightweight price and smooth integration of PC Partner make up for the heavyweight RAM requirements.

—Russ Lockwood

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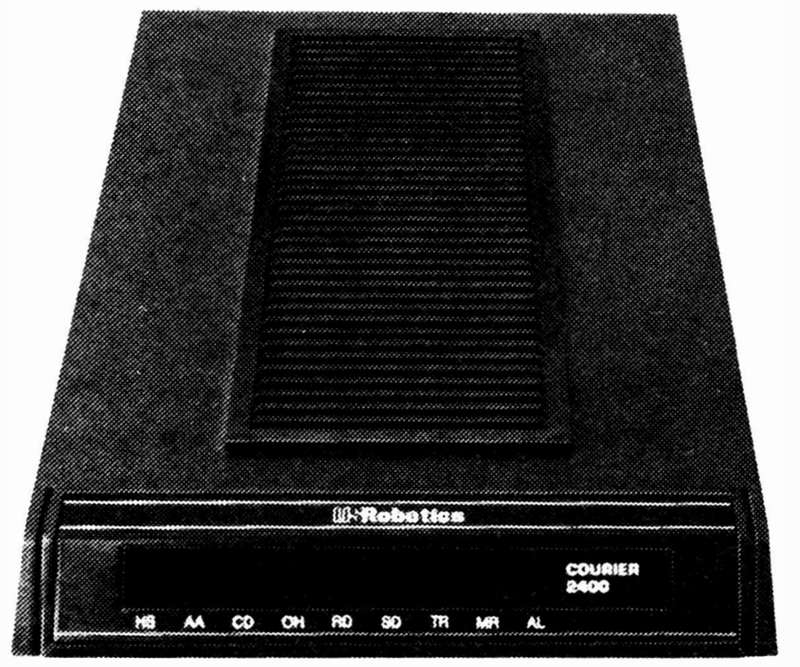

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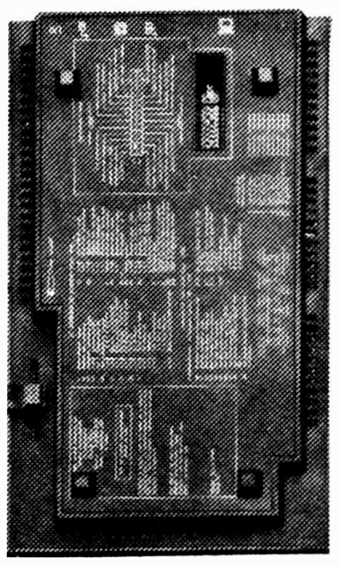
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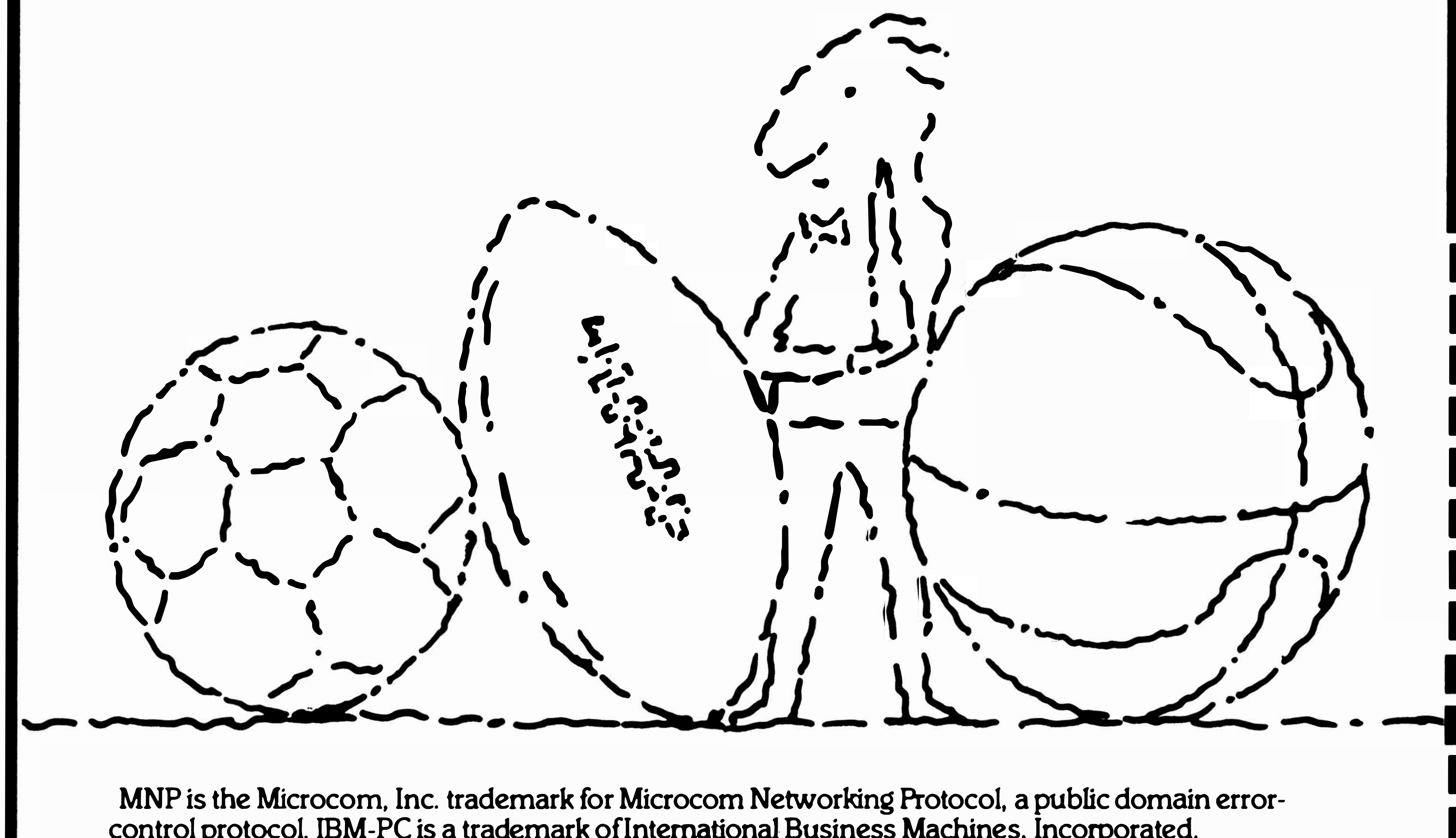

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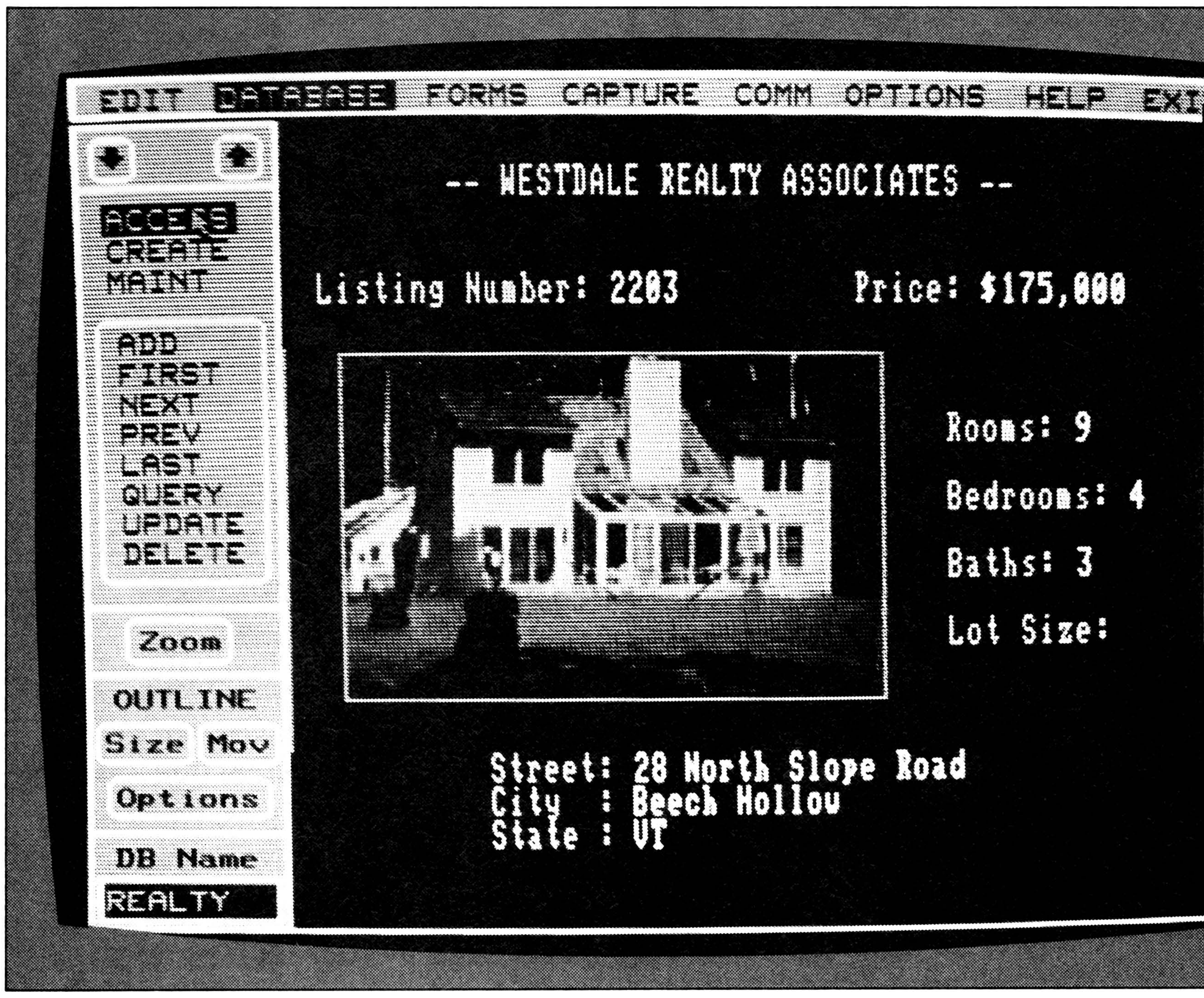

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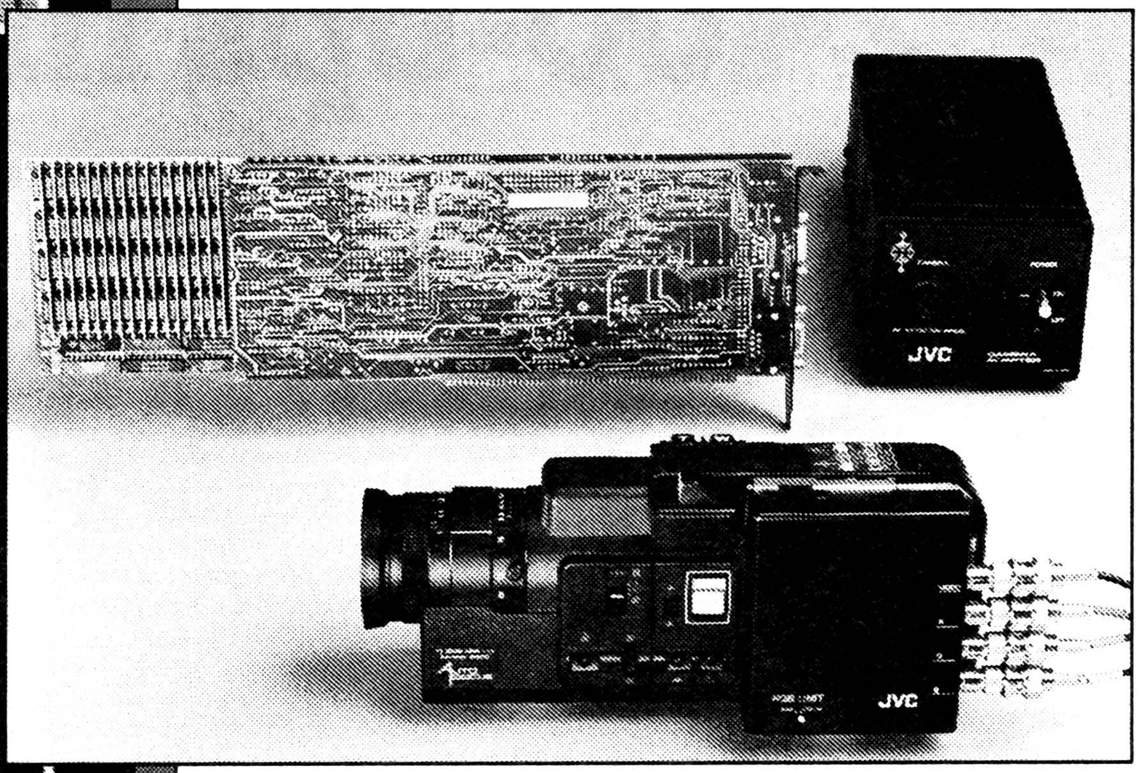

PicturePower integrates data base software, digitizing board, and video camera to create a versatile video data base system.

A Video Data Base

PICTUREPOWER *is a software/hardware package that integrates photograph-quality images into a data base program; it runs on an IBM PC, XT, PC AT, and compatibles with 512k of memory, a mouse, a black and white or color video camera, and an RGB or composite analog monitor; not copy protected; the black and white package includes the software, a Tecmar Graphics Master board, and a Chorus PC-Eye 1000 board, plus a Panasonic video camera, $2,580; the color package includes software, an AT&T Targa board, and a JVC color video camera, $5,435 retail. PictureWare, Inc., 111 N. Presidential Blvd., Bala Cynwyd, PA 19004; (215) 667-0880. (For more information, circle 261 on one of the Free Information Cards.)*

Building a computer system is a lot like assembling a successful management team. You select qualified individuals and integrate their strengths into a single entity. The quality of interaction among the pieces spells the difference between a productive system and a disruptive Frankenstein.

Pictureware has created an effective system by surrounding its data base software with several pieces of video hardware from leading manufacturers. The resulting PicturePower video data base system combines video, graphics, and data base functions into one well-integrated package.

The color system we tested included a JVC color video camera with RGB attachment, an AT&T Targa board, and Pictureware's PicturePower data base software. We displayed the images on a Sony Multiscan color monitor set to analog mode. With so many pieces, installation from box to working system took several hours. The crucial Targa board proved to be especially cantankerous, since AT&T's documentation left some gaps in the information. For example, AT&T takes great pains to explain the different dip switch settings for computers with a data bus speed (*not* microprocessor clock speed) of 6MHz or less, but neglects to tell you the exact data bus speed of any computer except the AT&T 6300. Unfortunately, Pictureware's user guide offers no help, simply referring you to the AT&T manual for dip switch settings.

Worse, EGA boards conflict with the default Targa memory address, necessitating several dip setting modifications. And using an extended memory board with an EGA board in an AT or compatible also causes memory address conflicts. To sort this all out, we called Pictureware's technical support line. The support staff is knowledgeable, fast, and most important, effective. They had us up and running within 20 minutes. Save time and call before you install the board.

Capturing images is done by pointing the camera at an object and using a mouse to highlight the menu option "snap." The image freezes on the screen and may be manipulated in several ways. You can flip the image upside down, rotate it 90 degrees, crop it, shrink or enlarge it, and even draw over it with a built-in graphics program. Controls altering the hue, saturation, and brightness help you capture a clearer image.

Working with PicturePower is a very straightforward process similar to using other data base management programs. After defining the fields and the form that holds the fields, you start entering information. The mouse-driven environment, complete with pop-up menus, provides quick access to data base functions.

A valuable feature is a tie-in with dBase III data bases. By using a utility, PPaccess, you can tap into PicturePower's forms, data, and images, display them on the screen, and enter information into the data base from within dBase. This process is fairly complex, so novices may find themselves confused; it's really a job for an experienced dBase programmer.

A communications function provides the ability to transmit images via a Hayes Smartmodem. Of course, both transmitting and receiving computers must be running PicturePower.

The one disappointment with the package is its inability to print, on paper, information or images stored in a data base. However, Pictureware is aware of this limitation. By the time you read this, the company should have released an update incorporating support for the Hewlett-Packard LaserJet+.

Once you install the package, PicturePower provides high-quality images for your data base. The price, especially for the color system, is high, and the current lack of a print function limits the usefulness of the system. Yet the addition of a dBase III tie-in and the communications feature provides flexibility. If you need to catalog images along with data, take a serious look at PicturePower. This versatile system goes a long way toward delivering a dream video data base.

—Russ Lockwood

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A Stellar Graphics Tool For The Mac

ADOBE ILLUSTRATOR *is a graphics design program for Apple's Macintosh computers (minimum 1Mb of RAM); $495 retail; second floppy drive or hard disk recommended; access to LaserWriter or Postscript-driven output device recommended; copy protected; Adobe Systems, Inc.; 1870 Embarcadero Road, Palo Alto, CA 94303; (415) 852-0271. (For additional product details, circle 266 on one of the Free Information Cards.)*

Anyone serious about using a Macintosh computer to produce top-quality graphics should take a long, hard look at Adobe Illustrator.

Illustrator is neither a simple paint program nor a simple drawing program. Illustrator is a professional graphics tool that, with a little help from the user, transforms scanned images or drawings into high-quality artwork. It does this by allowing users to tap the power of Postscript, Adobe's page-description language, the de facto standard in desktop publishing.

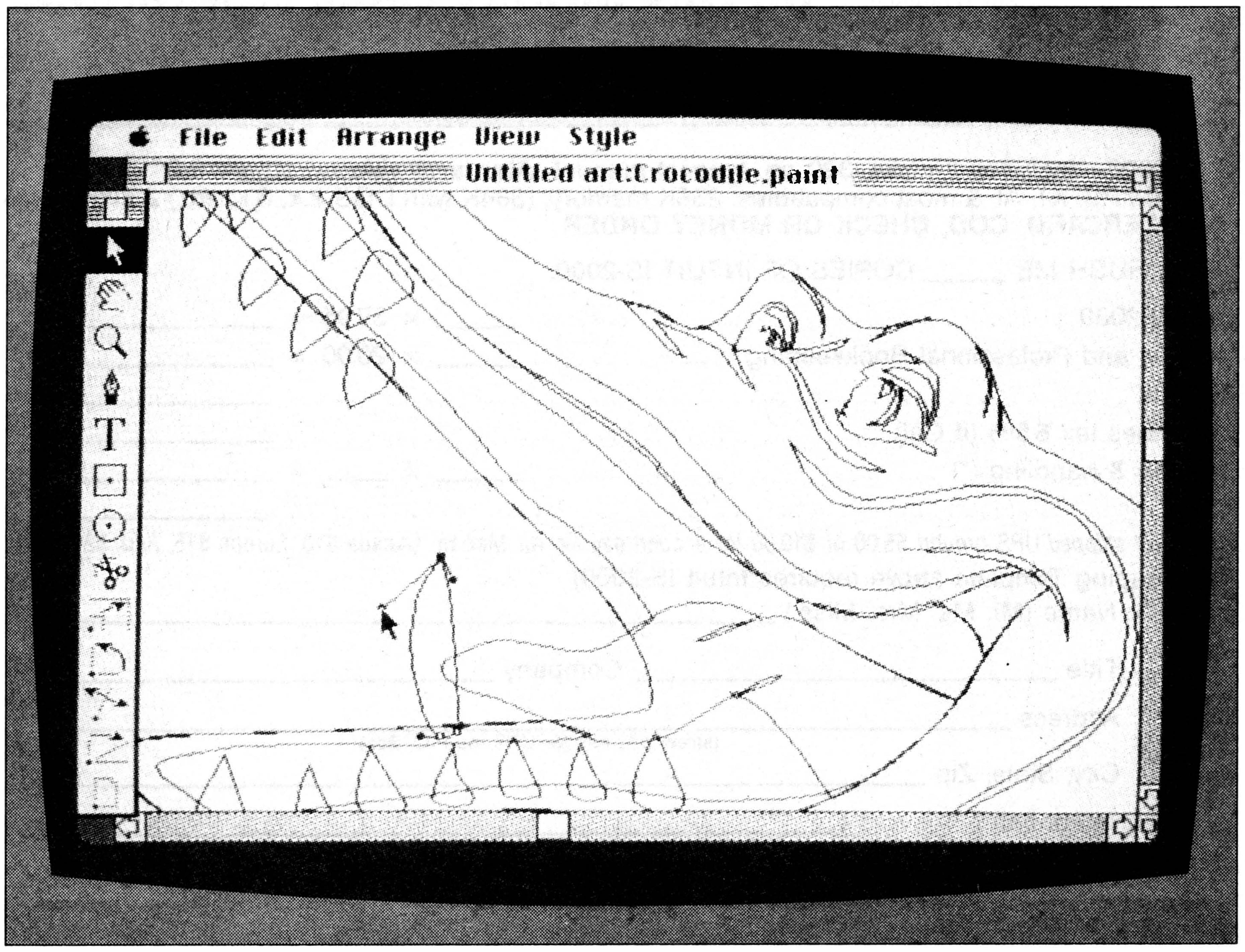
A drawing created in Illustrator can be printed with Apple's LaserWriter at 300 dots per inch or with an Allied Linotype Linotronic 300 typesetter at a resolution of 2,540 dots per inch. The quality of the printed image depends only on the quality of your output equipment and the skill with which graphics are produced. It's also possible to output first drafts using Apple's Imagewriter dot matrix printer.

Illustrator's purpose is to transform scanned images or images generated using MacPaint or MacDraw (or other programs that produce the same type of graphic files) into magazine or book-quality art. Illustrator operates by turning rough images into a collection of mathematically defined lines and curves. Instead of saving your work as groups of dots, as do most other drawing programs for the Mac, Illustrator saves them as part of a Postscript program.

Perhaps the best way to use Illustrator is in tandem with scanned images. Using scanned images eliminates the tedium of freehand drawing required when producing a picture in MacPaint or MacDraw. Because Illustrator enables you to create crisp, clean lines from rough images, the quality of images produced by your scanner for Illustrator need not be high.

A scanned image or drawing loaded into Illustrator is called a template. Using a template is similar to placing tracing paper over an original drawing in order to recreate either a portion, or all of the drawing. The lines you add to the template along with other changes, called artwork in Illustrator parlance, never actually affect the original drawing. But unlike artwork created on tracing paper, Illustrator's artwork is easy to modify and rework. Images can be rotated, skewed, mirrored, and duplicated. It is also possible to add and modify text easily to further improve the impact of artwork created with Illustrator.

You use the Mac's mouse to add the artwork to the templates. By clicking the mouse button you place anchor points (dots) on the screen and then use a series of lines and curves to connect the dots. As an aid to placing the dots and to drawing lines, Illustrator reduces and enlarges artwork via nine levels of magnification, ranging from 50 percent reduction to 1,600 percent enlargement. Multiple views are also possible, enabling you to work on artwork while at the same time previewing changes as they are made. Artwork placed on templates is painted using varying levels of gray or color.



Clicking the mouse button puts dots on-screen that can be joined with lines and curves.

We went through Illustrator's entire tutorial (which took several hours), practiced drawing on templates provided on gallery disks that came with the program (to get the gallery disks, users must send in completed registration cards), and experimented on our own. In general, we found the program and accompanying material to be of high quality (a 30-minute videotape, a running demo with music, and a full tutorial are provided to help you get started). New users may find the program's manual somewhat confusing since it intermixes computer, art, and occasionally, mathematical terminology, but it is generally useful (and looks terrific). The toughest thing about Illustrator is learning to use the mouse as a pen.

Unlike programs such as MacPaint, in which you draw a line by clicking on a pen tool and moving the mouse on the desktop, the pen in Illustrator connects dots. To draw a straight line, for instance, click point A, then move the pointer to point B and click again; Illustrator connects the dots.

Once we got used to using Illustrator, we found drawing with it addictive. We spent hours carefully drawing, repositioning, shading, rotating, scaling, skewing, and doing a lot more to various pieces of artwork. If we didn't like one drawing, we'd simply put it away and use the same template to start another.

Illustrator isn't a toy and at $495 it isn't the type of program you buy on a whim. At present, Illustrator is in a class of its own—no other graphics program currently available can compare to it. It's hard to imagine anyone who is serious about using a Mac for illustration or design work not taking the time to see how Illustrator works.

One final note: Since Illustrator's artwork can be saved in encapsulated Postscript format for use on IBM PCs, you can also use drawings created on the Mac in some PC programs.

—Amanda C. Hixson

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Leap-Frogging The Competition

XPRESS 1.0 *is a desktop publishing program that runs on the Apple Macintosh 512k Enhanced, Plus, SE, and II (minimum 512k, dual 800k floppy disk drives required, hard disk recommended); $695 retail; copy protected (a hard and floppy disk installation program is included); Quark, Inc., 2525 W. Evans, Suite 220, Denver, CO 80219; (303) 934-2211. (For additional information, circle 264 on one of the Free Information Cards.)*

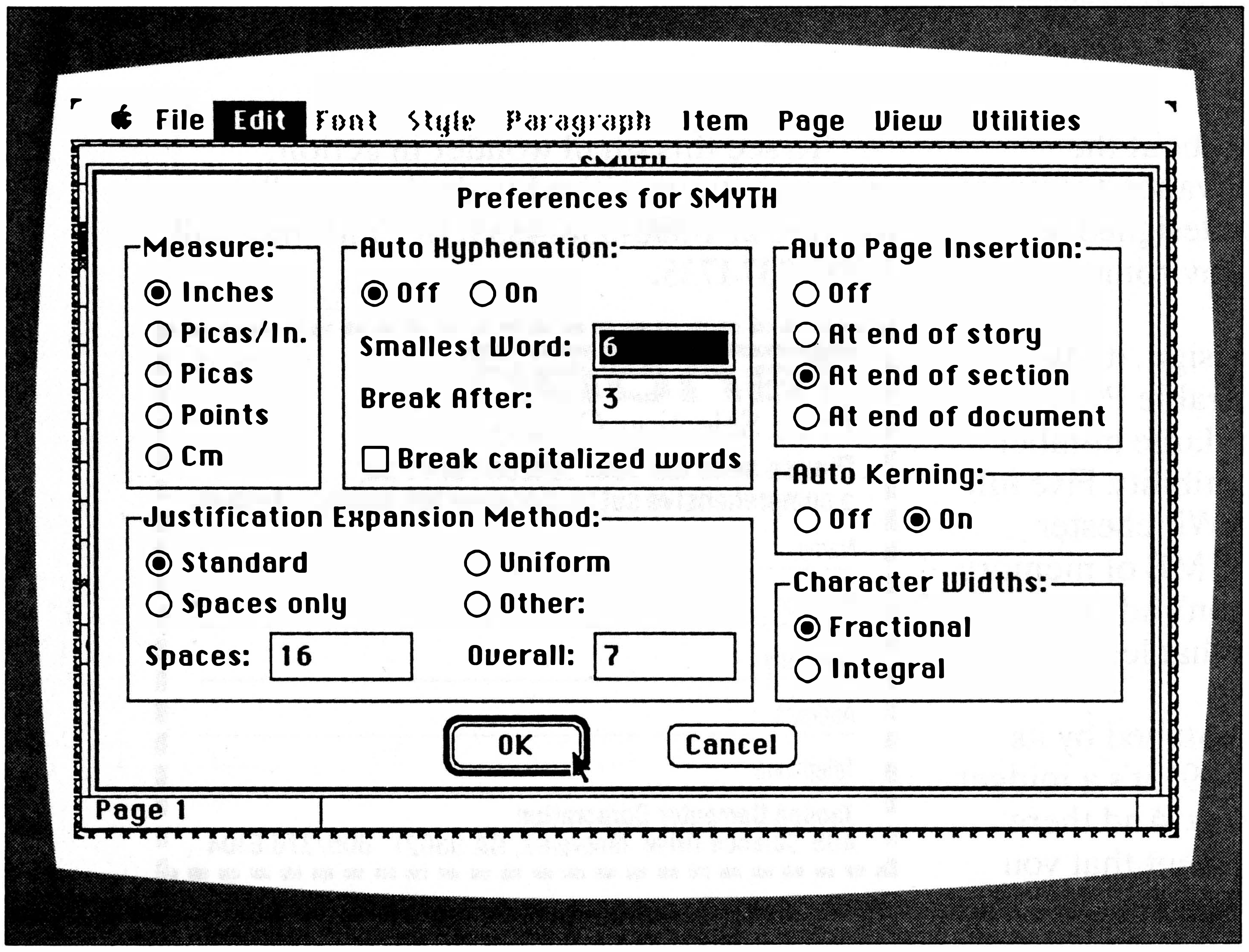
The number of recent upgrades to Macintosh desktop publishing software programs only serves to make the recent release of Quark's XPress all the more welcome, refreshing, and thoroughly impressive.

Here (in its initial release as version 1.0) is a program that has most of what it takes to stand out from other desktop publishing programs. Features include a word processor with spelling checker, extensive on-line help, and global automatic kerning or manual kerning. The adage that "good things come to those who wait" is most apt for those who have remained on the desktop publishing sideline until now. Note that while the program is copy protected, the installation program provides three "free" installations that can be split in any manner between hard and floppy disks.

Quark believes enough in its program to expect its customers to pay more for it, even though it is positioned against the entrenched "stars" of desktop publishing, including PageMaker 2.0 ($495 from Aldus), Ready Set Go 3.0 ($395, Letraset USA), and MacPublisher III ($295, Boston Publishing Systems).

A double-click on the XPress icon brings you to a blank screen and menu bar where you open either a new or existing document. Opting for "new" presents you with a setup dialog box from which you choose the page size (including height and width), page margins, and page guidelines (for the number of columns, up to 10, and the gutter or space between each column). You can either accept the program's default settings (more about these later) or enter custom settings. After clicking the OK button, you can view the blank first page. XPress initially creates a single large text box. It's up to you to alter that setup for the inclusion of graphics elements and window dressing such as boxes, lines, and arrows. The program's design tools are selected from a vertical palette on the left side of the screen.

Quark asserts that the program will accept word processing files from MacWrite and Microsoft Word. The assertion is not entirely accurate. The program shares a problem with PageMaker 1.2 and Ready Set Go 3.0 when attempting to import fully formatted files with fonts and typestyles from Microsoft Word 3.0. While PageMaker 1.2 and Ready Set Go 3.0 will import the files but strip out the formatting, XPress couldn't even read the file. However, if the document is saved as a Word 1.0 file, an option Word 3.0 allows, XPress will read everything in the file. The problem, for XPress and the other programs, was initially discovered when Microsoft altered its file-handling routines with the release of Word 3.0 earlier this year.



Preferences for SMYTH

Measure: ● Inches ○ Picas/In. ○ Picas ○ Points ○ Cm

Auto Hyphenation: ● Off ○ On

Smallest Word: 6

Break After: 3

☐ Break capitalized words

Auto Page Insertion: ○ Off ○ At end of story ● At end of section ○ At end of document

Justification Expansion Method: ● Standard ○ Uniform ○ Spaces only ○ Other:

Spaces: 16

Overall: 7

Auto Kerning: ○ Off ● On

Character Widths: ● Fractional ○ Integral

The Preferences command enables you to set the parameters for the document you're working on.

Unlike the two other page makeup programs mentioned above, XPress displays multiple pages in a vertical format (unless you're working with facing pages). So you won't see page number icons on the bottom of the screen that enable you to move through the pages of a document by clicking on the icon. Instead, a pull-down menu enables you to enter the number of the page you need to view. You have the choice of using the GoTo command, a keystroke combination, or the mouse and vertical scroll bar on the right side of the screen to move through your pages .

XPress makes extensive use of keyboard commands and the cursor keys on the Mac Plus keyboard (which was used for this review). Some of the keyboard commands, however, are less than graceful. While the majority of Mac word processing and page-makeup programs use the Command-U combination for underlined type, for example, XPress opted for Shift-Command-U. There are similarly awkward keyboard combinations for other type styles and paragraph orientations (left, right, center).

The program provides five settings (Fit in Window, 50 and 75 percent, Actual Size, and 200 percent) in which to view a document. There are keyboard commands, but the exact keyboard sequences are buried on page 16 of the appendix in the program's otherwise excellent spiral-bound documentation. No indication appears on the View pull-down menu that would tip off a user to the existence of the Option-click (to move from any view to Actual Size and from Actual Size to Fit In Window) or the Command-Option-click combination (any view to 200 percent and 200 percent to Actual Size).

Quibbling aside, Quark has greatly enhanced our perception of what these desktop publishing programs are capable of doing. The company has added a Transfer command, available from the File menu, that provides a dialog box from which you can quickly start another program. Assume you're working in XPress and decide to crunch some numbers. Selecting transfer will provide a dialog box with the names of the applications on a hard disk, for example. Double-click-

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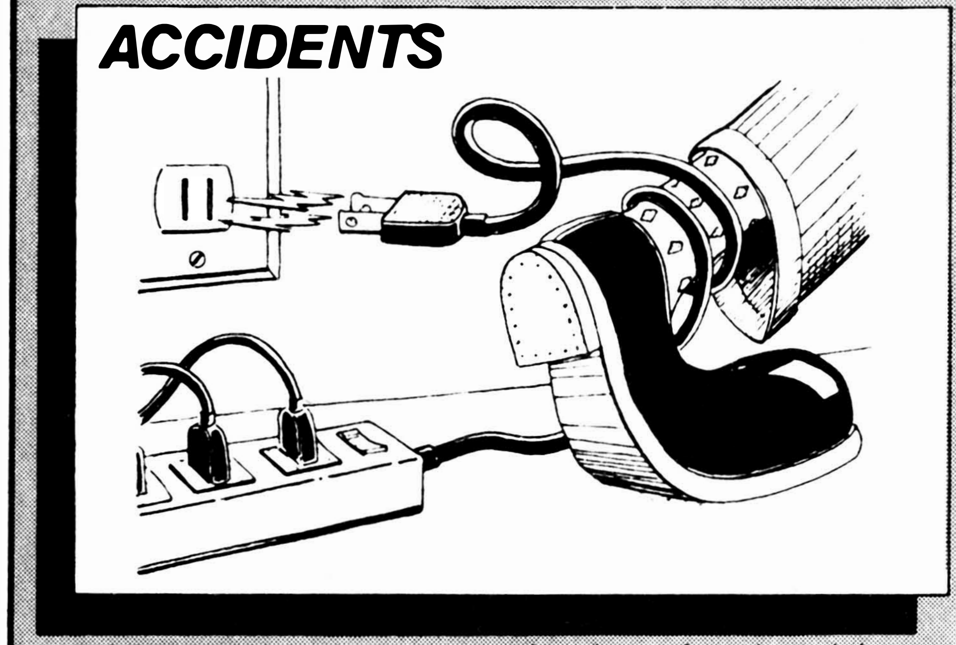

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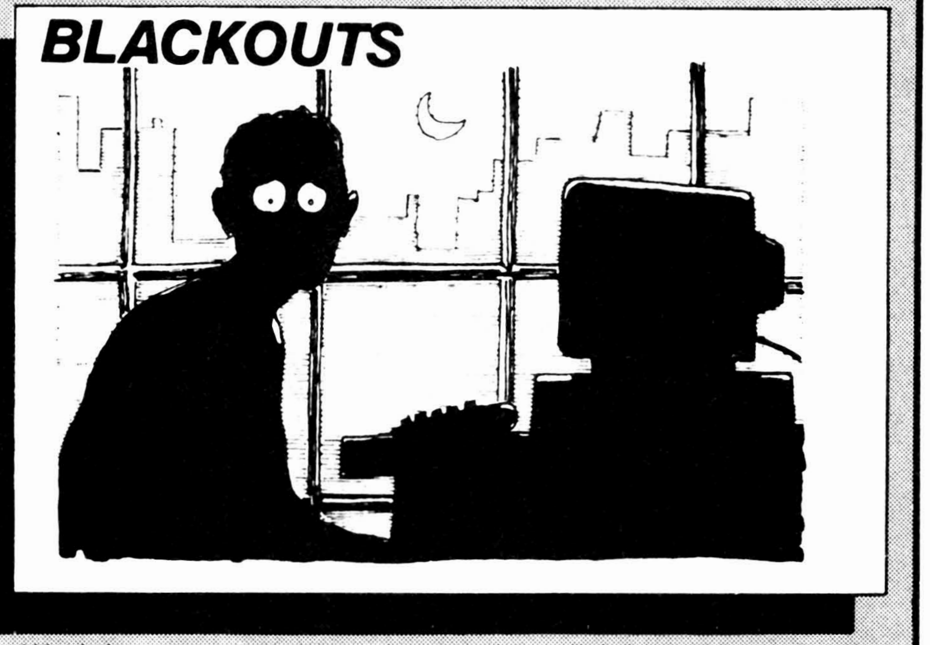

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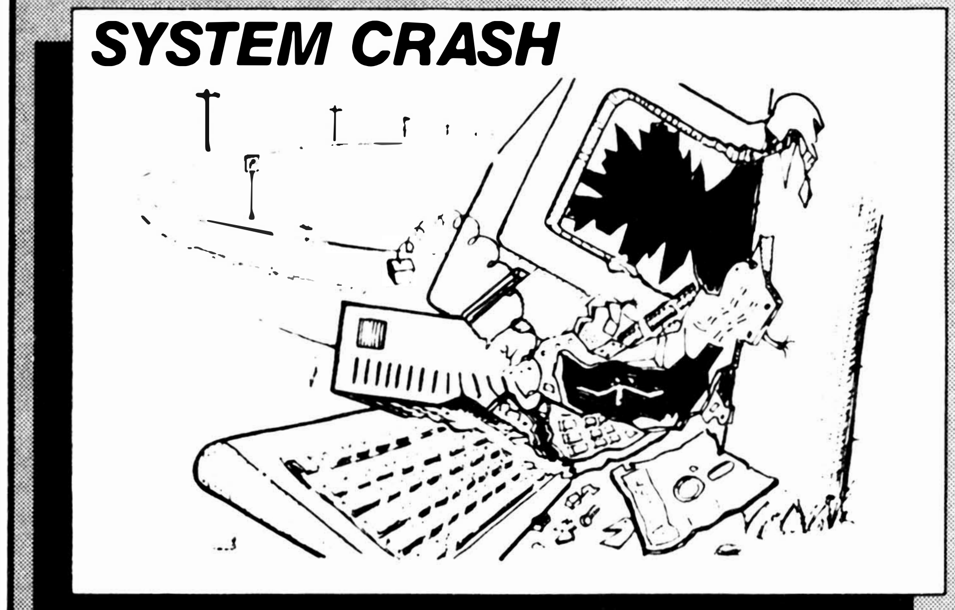

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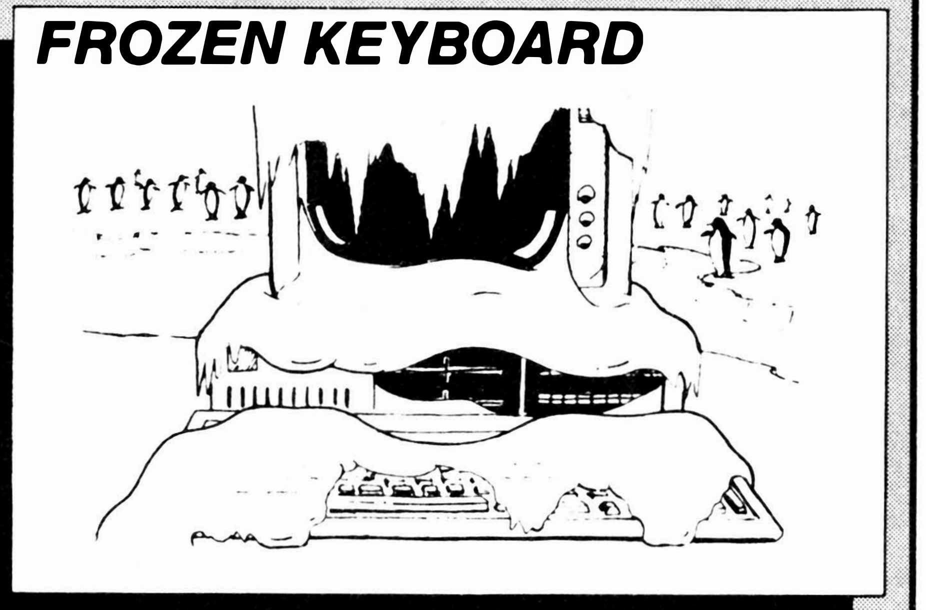

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PRODUCT REVIEWS

ing on the name of a program will start that application. Upon quitting the one program, let's say a spreadsheet, you are automatically returned to XPress's start-up screen. This is not a replacement for Switcher, but another alternative. Likewise, the program's Frame Editor file enables users to alter the current frames (the borders for graphics elements) or create entirely new frames. Finally, we were surprised (and a bit gratified) to discover that XPress incorporates several Microsoft Word commands, including those for increasing and decreasing the size of selected text (Shift-Command-< and Shift-Command->).

The ongoing convergence of desktop publishing and word processing software continues with XPress, which includes extensive word processing capabilities, an 80,000-word spelling checker, unlimited user dictionaries, and hyphenation dictionaries that can be augmented by user entries. XPress also provides a count of the number of words in the document and the number of words whose spelling is suspect. Even Microsoft Word 3.0 is remiss in not supplying a word count.

If you're working on a multipage document that will maintain the same format, XPress provides the ability to create default pages (templates) that can be saved and then modified according to your needs. The feature is similar to PageMaker's Master Pages feature. In addition, if, for instance, you regularly put out a newsletter that includes a variety of page formats, the program enables you to create separate default pages (that are saved as separate files) which can be opened and filled from within the document you're currently working on.

Layout professionals will be quick to recognize that XPress was produced with them in mind. It's possible to size fonts up to 500 points (where most other programs have an upper limit of 127 points), display screen text in six gray levels, and print text in seven colors (providing you have a color printer such as an Apple Imagewriter II).

The program imports MacPaint graphics and enables you to drop in artwork that has been saved in the PICT and TIFF formats, especially useful for dealing with scanned images.

For the present at least, XPress provides an array of features that the competition will be hard pressed to duplicate. The price is high—but you get what you pay for.

—Jack Bell

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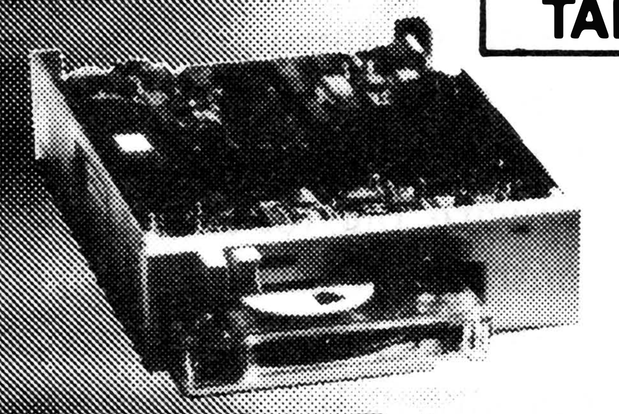

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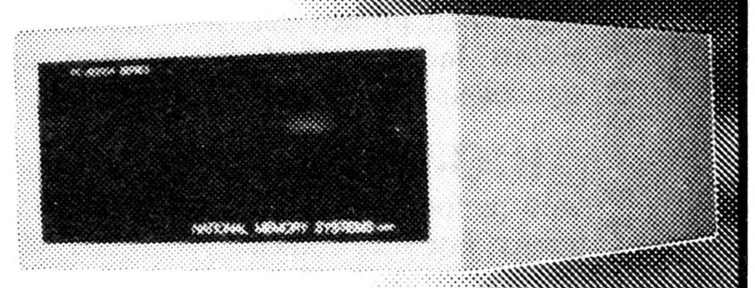

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PRODUCT REVIEWS

Rock Solid 20Mb Hard Disk Drive

THE CORE HC82 HARD DISK *with high speed controller has a capacity of 82Mb and an average seek time of 16ms. The $2,995 cost includes software to partition beyond the 32Mb limit set by DOS. The HC uses an ESDI interface and 1:1 interleaving to improve storage capacity and data transfer speed. Core International, Inc., 7171 North Federal Highway, Boca Raton, FL 33431; (305) 997-6044. (For more information circle 258 on one of the Free Information Cards.)*

For a couple of months, the Core HC82 82Mb hard disk was the fastest PC fixed disk in the world, with an average access time of 16ms. But as in the volatile world of superconductors (which sees records broken weekly), the hard disk arena is advancing rapidly. Now the fastest drive—also from Core—is down to 10ms access time. By contrast, the standard drive IBM offers with its PS/2 Model 50 retrieves data at a leisurely 80ms.

Despite the slow speed of the IBM drive, it, too, is part of the move toward higher performance, using several new techniques to handle data efficiently. Of the features on IBM's disk (RLL [run length limited, which improves data density and transfer rate] format, 1:1 interleaving, and disk caching) the Core drive offers the same or better performance in all areas but disk caching. The Core HC82's ESDI drive packs data closer together than IBM and transfers it to the controller faster. Its interleaving (the ratio of sectors read to sectors scanned) is the same. Though Core doesn't offer disk caching software, you can buy it from other manufacturers. In overall performance, the Core drive is several times faster than the IBM.

But comparing the Core drive to IBM's is a little unfair. Despite enhancements, the Model 50 drive is basically just an average drive. There's nothing average about the HC82, which is engineered for optimal speed and longevity, but at a price. In fact, the 82Mb Core drive alone costs only $600 less than the $3,595 20Mb IBM Model 50 (without monitor).

What do you get for all that money? You get speed, extensive data storage capacity, and great reliability. Certainly such performance would be hard to justify for a casual user. Yet for certain business situations, the added features are well worth the cost. For example, disk-intensive operations, such as data base queries, run substantially faster on an optimized drive like the HC82. And if the data base you're using is critical, the gain in reliability ensures against disastrous data loss. Core specifies its drives as having a 25,000-hour average time between failure, much higher than the industry average. (Of course, regular backups are essential for *any* storage media, no matter how reliable.)

An added benefit for users of large data bases is that the HC82's software will partition the drive beyond the 32Mb limit imposed by DOS 2.x and 3.x. Core's Gigafile program allows the entire 82Mb disk to act as a single logical drive and, in fact, can partition up to eight drives and a gigabyte of data into a single logical drive. You could load a single 82Mb data base on the HC82 unit and access it directly. For users with mammoth storage requirements, Core offers even larger disk drives in the HC series: 115Mb, 150Mb, and 260Mb.

Setting up one of these behemoths, however, is no cakewalk. Core did what it could with three slim manuals—one for the software, one for the disk, and one for the controller. It broke down the instructions according to the various options and according to the type of computer you have: IBM PC XT, PC AT, Compaq 286, Compaq 386, and so on. But there are so many installation variables (computer type, whether you need special ROM, number of drives present, and type of controller you use, to name a few) that some confusion is likely. Once you get the various drives set up, you use DOS FDISK and Format commands to prepare the drives, then Core's special GFDISK and GFORMAT programs. It can take a while, from several hours to an entire day if you have problems.

Fortunately, Core's technical support line is excellent, staffed by technicians who pride themselves on being able to get you up and running. If you buy the drive from a dealer, he or she will provide the support; to make sure its dealers are up to speed on the products, Core provides seminars as well as dealer training sessions.

Full shock mounting and precision manufacturing allow the company to offer a full three-year warranty on its drives. As Core representatives like to point out, if you're going to spend extra for a computer component, why not spend on the one whose failure can do much more than put a crimp in your business for a day or two?

—John Blackford

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From the Open Access II Network File

A crowd is gathering in front of the boat yard as *Stars & Stripes '86* is maneuvered into a stall at Driscoll Boats on Shelter Island, San Diego. World renowned 12 meter racing boats are a common occurrence at Driscoll's and the craftspeople go on about their business of repairing and constructing sleek racing and sailing boats. Driscoll Custom Boats, well known for its state of the art craftsmanship, is also known as one of the most efficiently run businesses on the Island. At the controls is Tom Driscoll, and the controls are Open Access II Network Software.

Tom's father, Gerry, started their boat yard back in the early '40s. Times have modernized boat building techniques, but not the business procedures of most yards. Few boat yards have been computerized, fewer still are sophisticated enough to have LANS; the exception is Driscoll Boats. Tom, having computerized in the early '80s, saw the effectiveness of having PCs at strategic locations throughout the yard to keep everyone continuously updated. He installed a four station network using 3Com's Etherlink cards and Novell's Advanced Netware 286.

Already an avid Open Access II user, he installed Open Access II Network Software on his network. Open Access II Network consists of a relational Database with programming, multi-user Spreadsheet with 3-D Graphics, Word Processor, Communications, and Pop-Up Desk Accessories.

Now, as materials go out of the stockroom they are charged to a specific job. As carpenters accumulate hours on finishing, the hours are logged in to the jobs as well as their individual timecards. Estimates are compared to actuals in daily reports. Customers are kept informed as their job progresses.

"Boat repairs and renovation are labor intensive. Customers want to see who worked on what, where and when. Using Open Access II Database we can give them an itemized, exact billing of everything that went into their boat." Tom grimaces as he recalls, "We used to do that all by hand. What a nightmare! Now I join five files together to build an invoice in a couple minutes; it used to take all day."

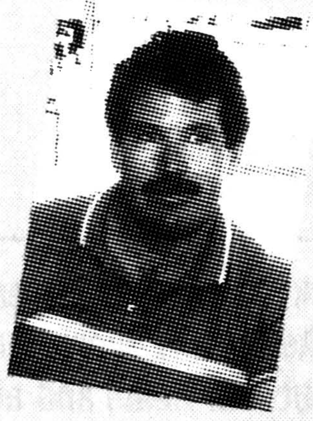
Most boat yards have a fixed rate for labor. However, using the calculations available in Open Access II Tom figures wage, overhead, insurance, workmen's comp and can charge labor at a variable rate dependent of skill level.

"The beauty of Open Access II is that we could develop sophisticated programs that are easy to execute. Even my brother Joe (he hates computers) can run them," Tom laughs. "SPI's support is the best I've seen. They've guided us through a lot of questions. They are very patient and very available."

Tom's sister Mary-Carol uses the Spreadsheet Module for payroll calculations and accounts payable/receivable worksheets. The entire family gets on the network and with a few key strokes can generate reports on labor, customer accounts, actuals vs. estimates, materials, and more. With Open Access II Network they can all be working in the Database at the same time in the same files. If they are in Spreadsheet they can see each other's figures updated simultaneously. All the information is gathered together and reports and correspondences are written in the Word Processor.

The next step in the automation of Driscoll Boats? Tom wants to add a Compaq Portable III to the other Compaqs on the network. Then, using the Open Access II Communications Module, he can work from anywhere — even the high seas.

"I'd Be Sunk Without Open Access II Network Software"



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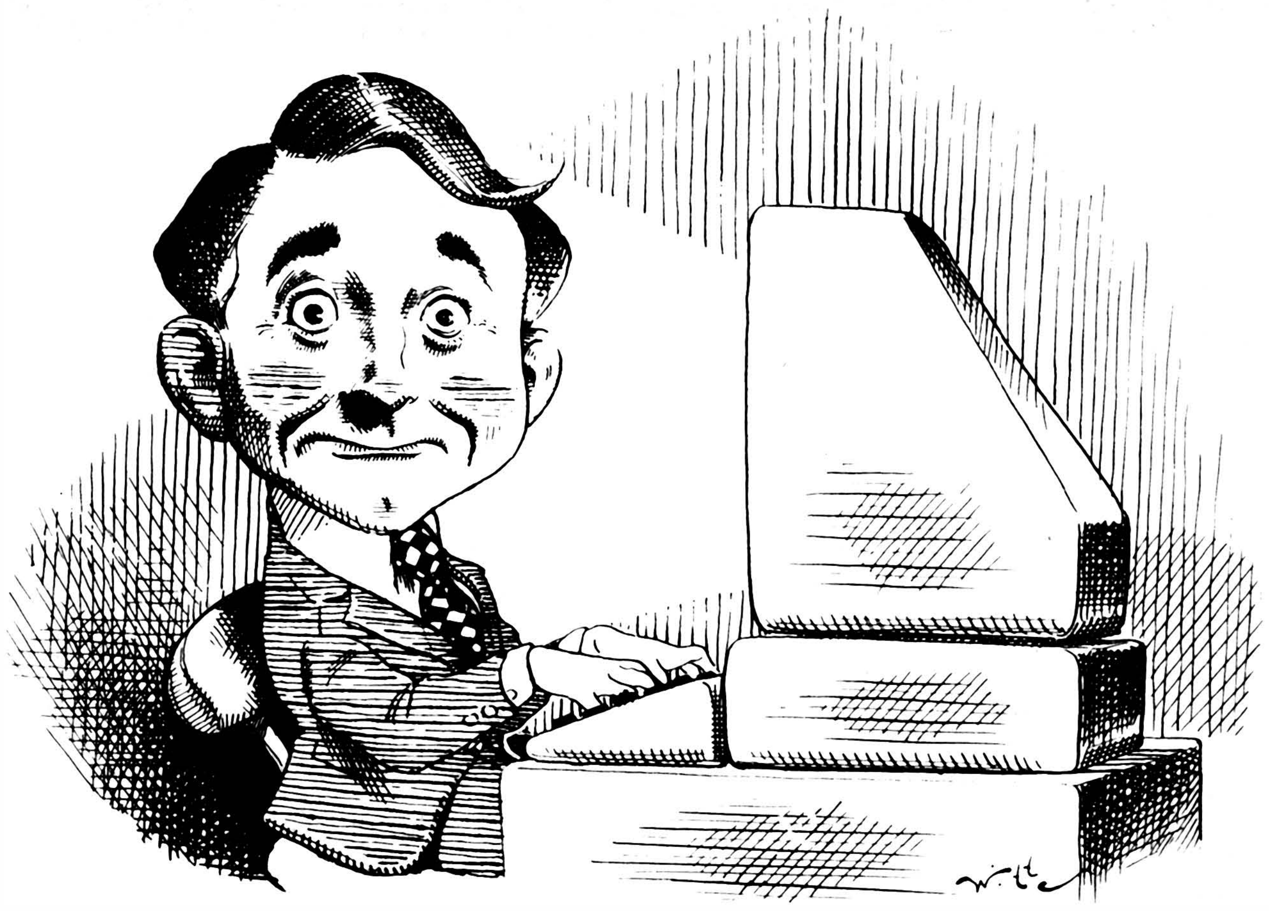

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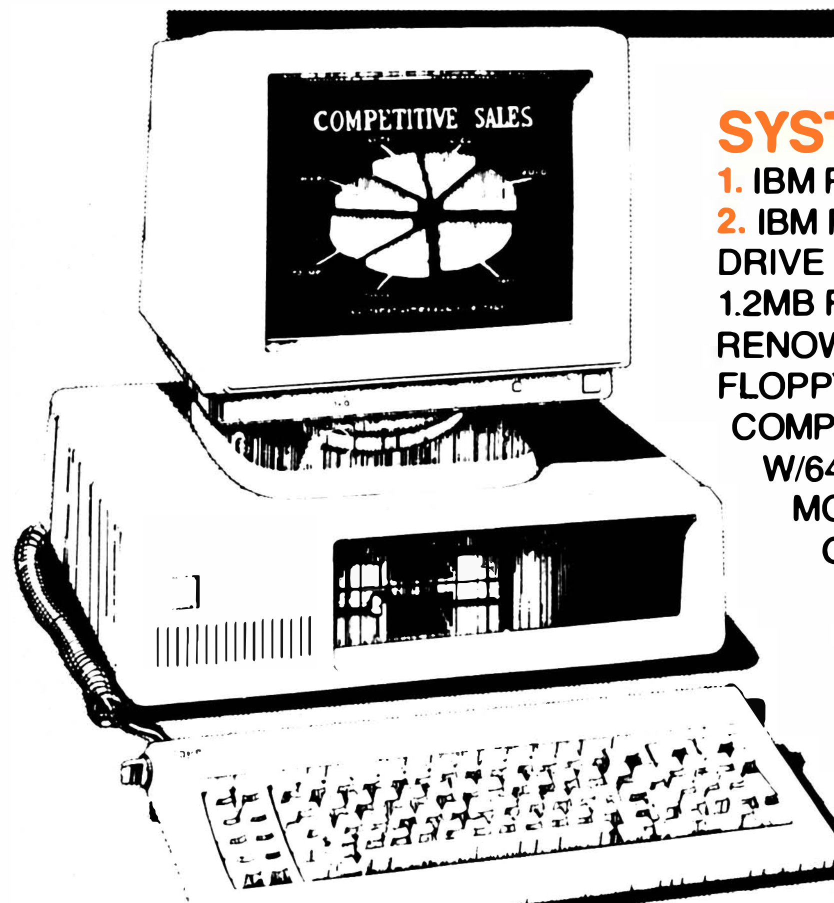

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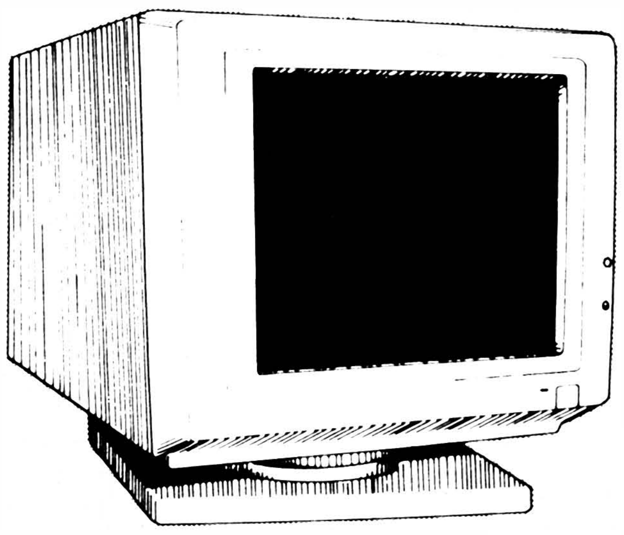

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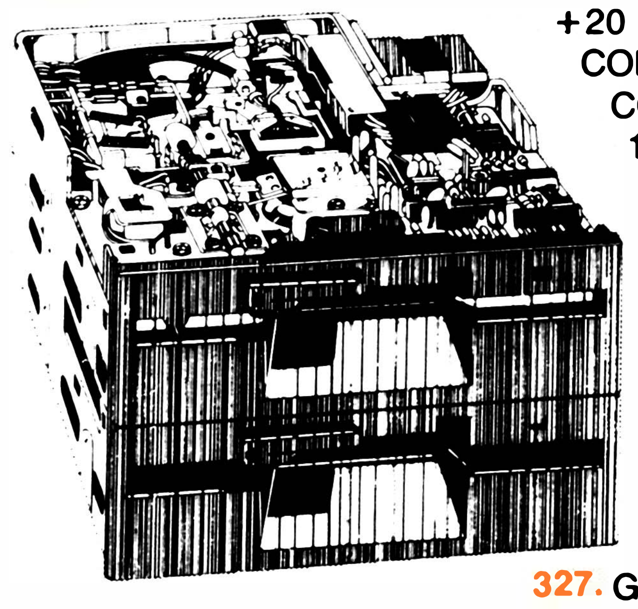

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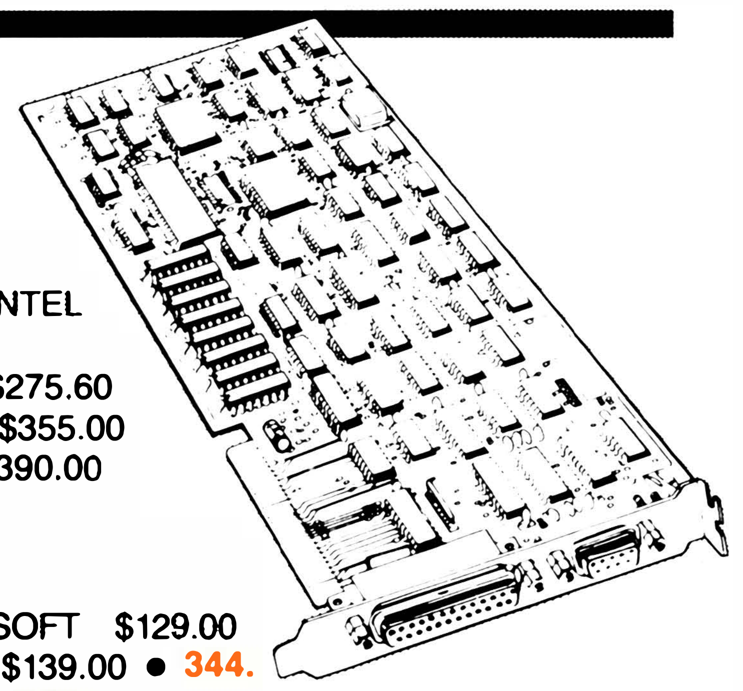

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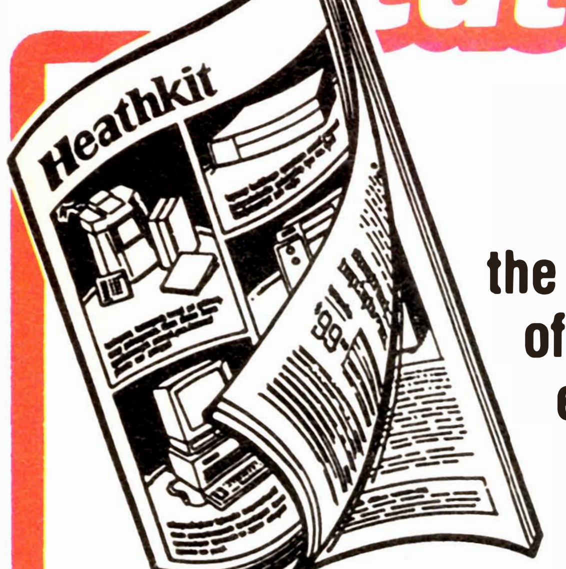

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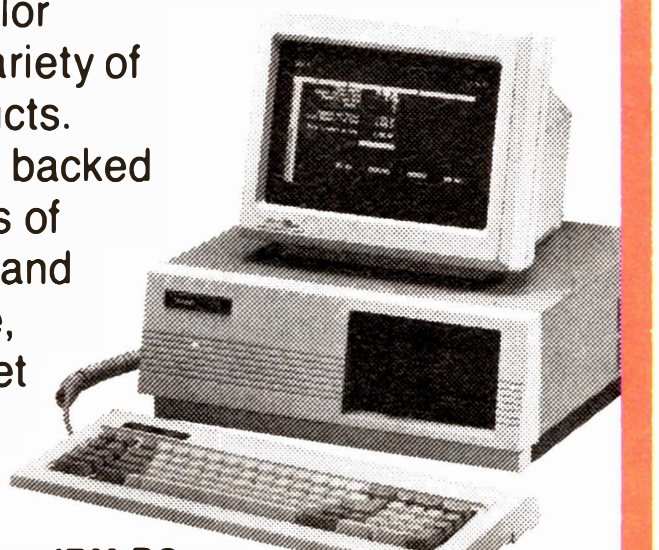

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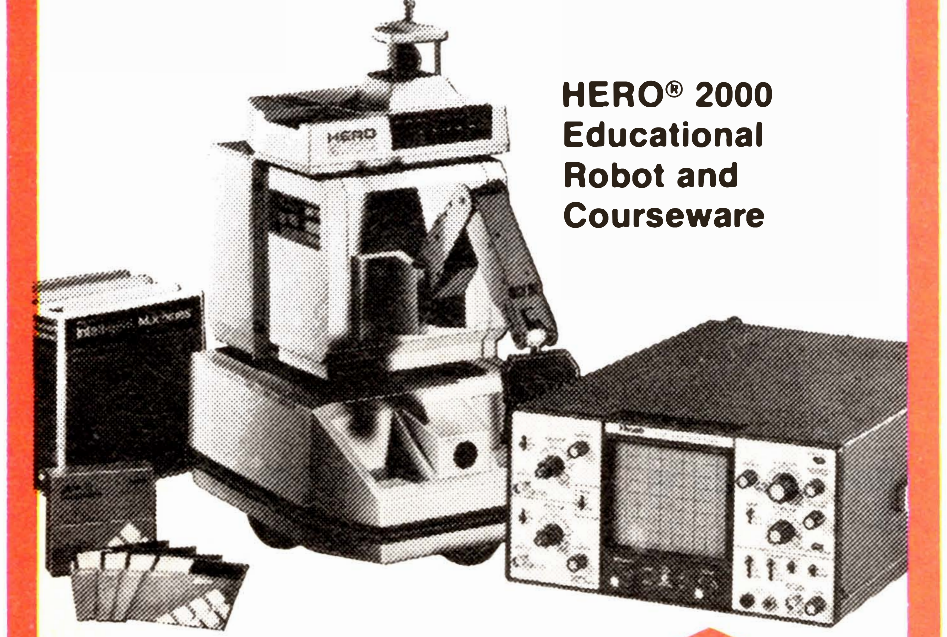

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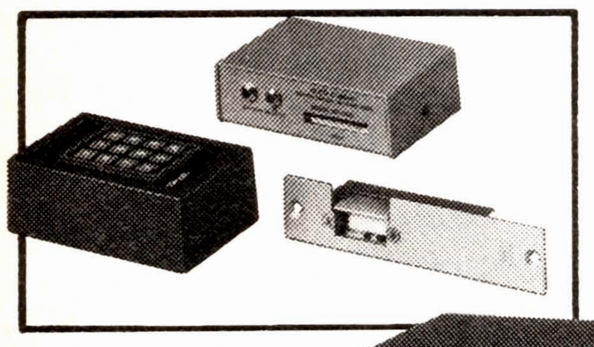

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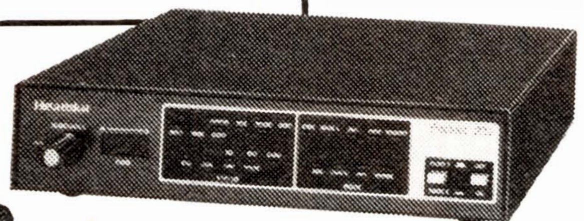

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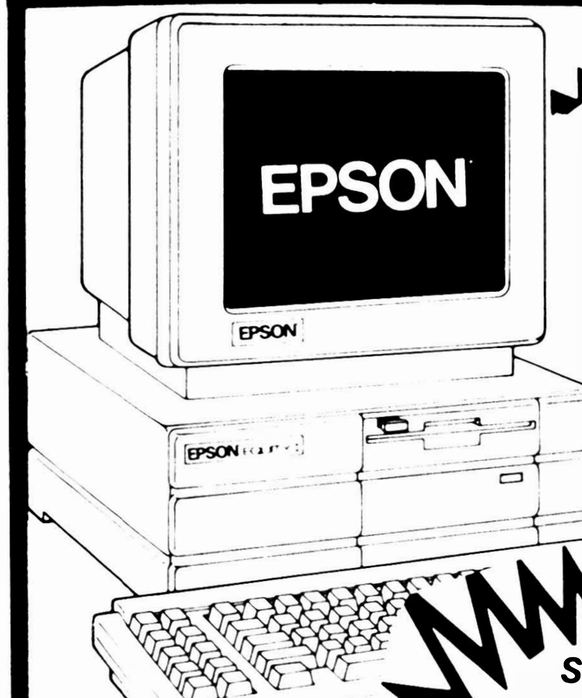

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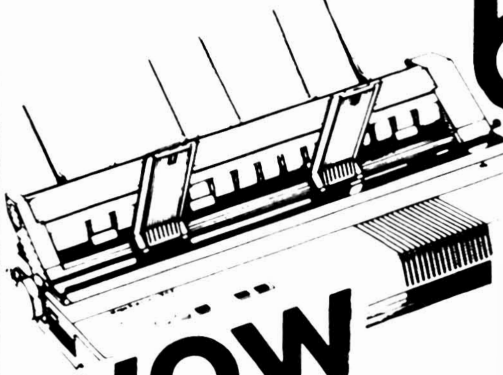

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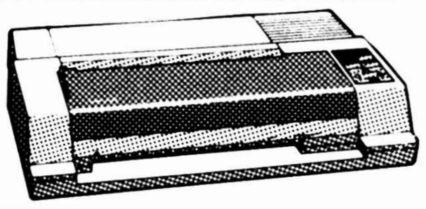

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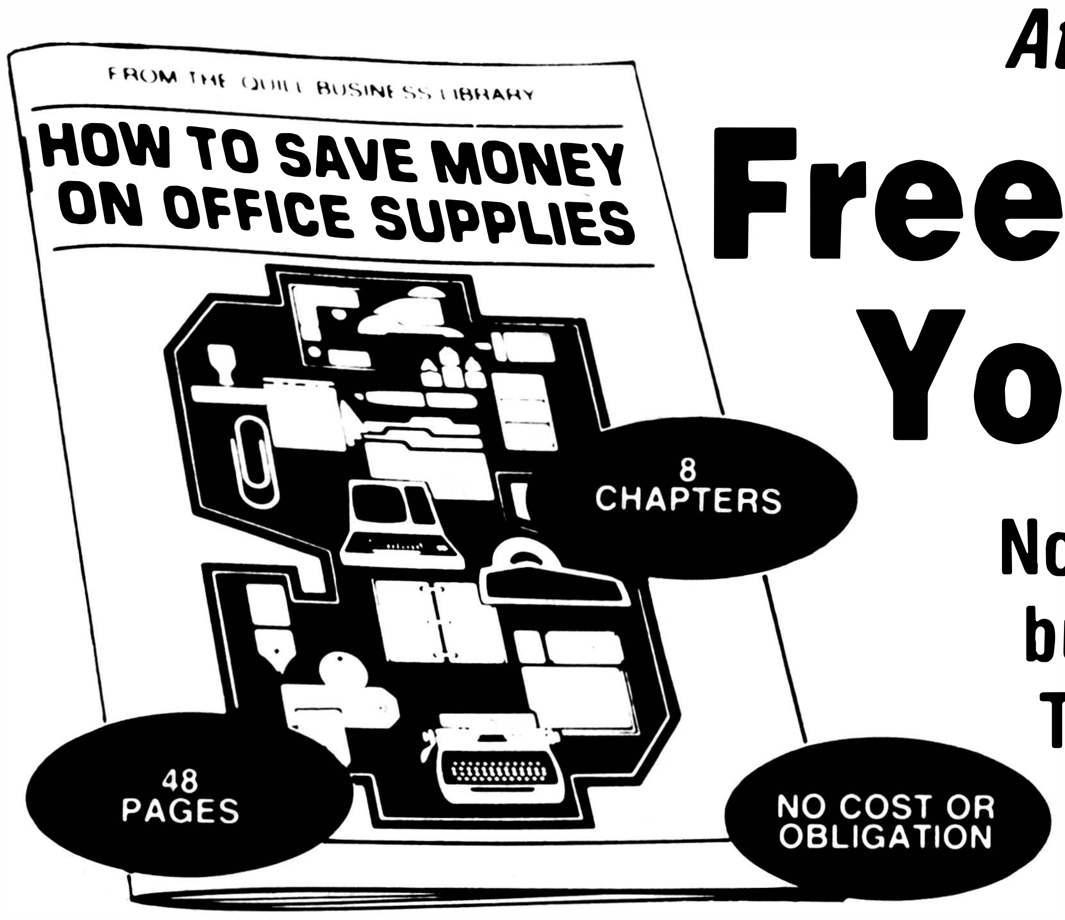
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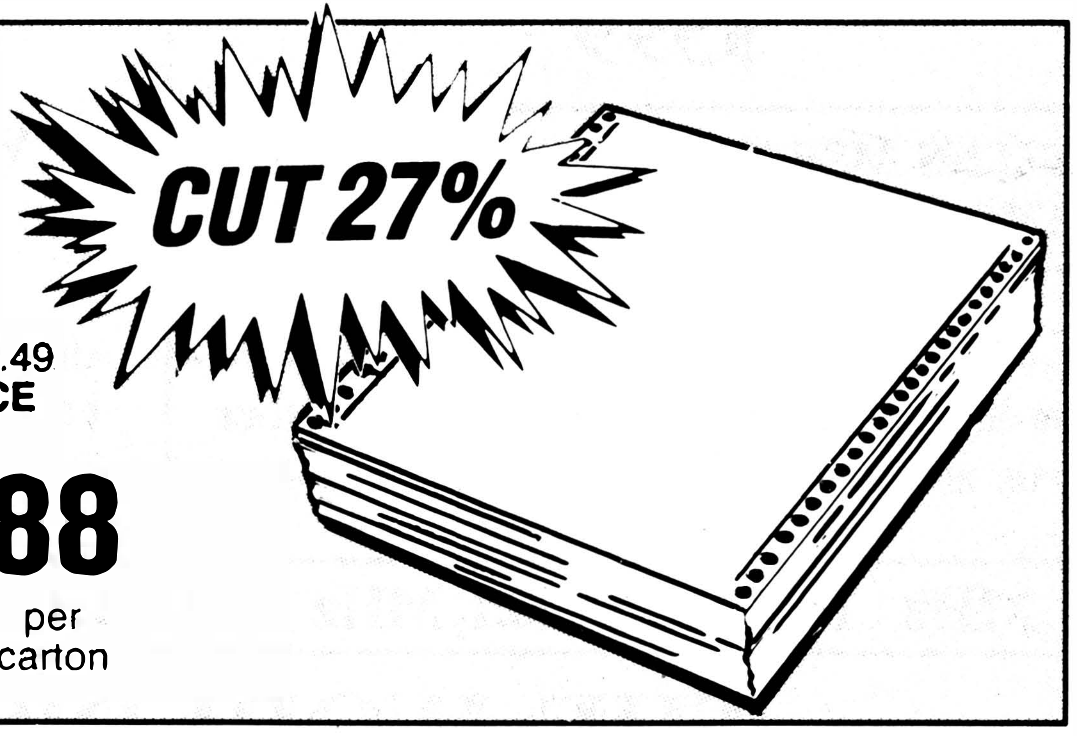

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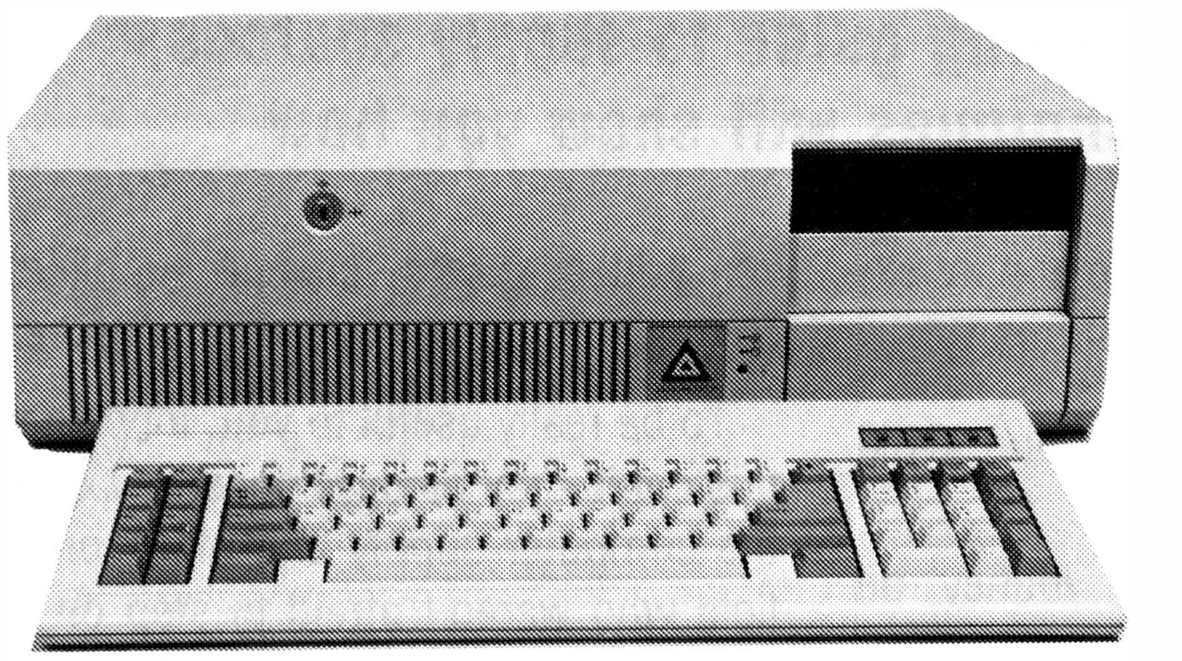

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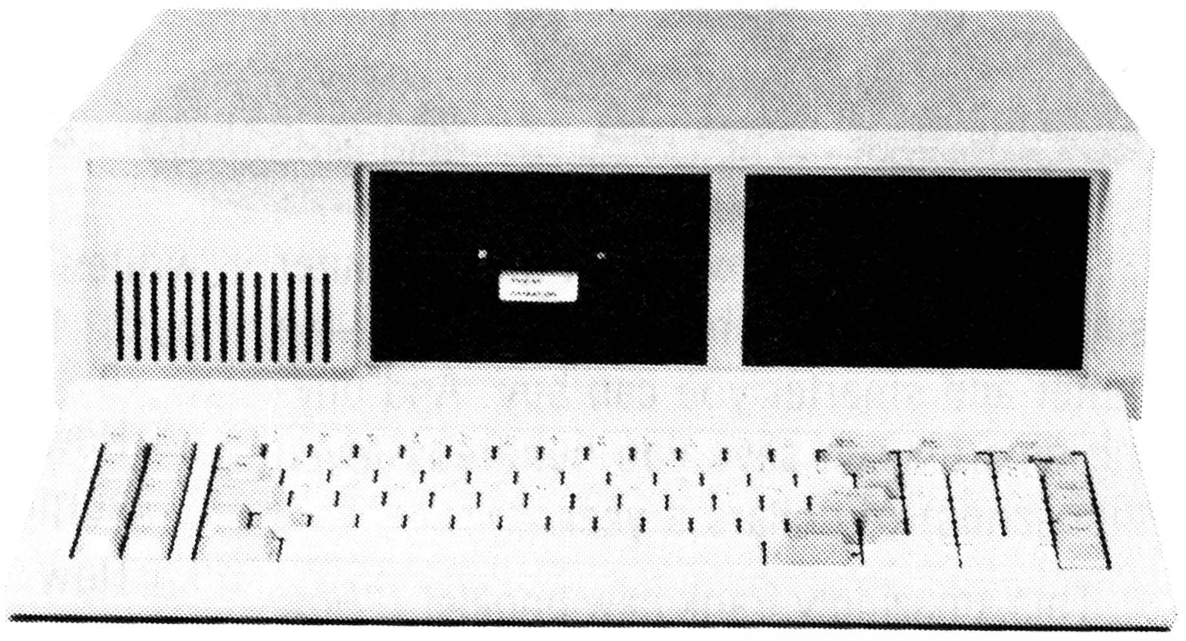

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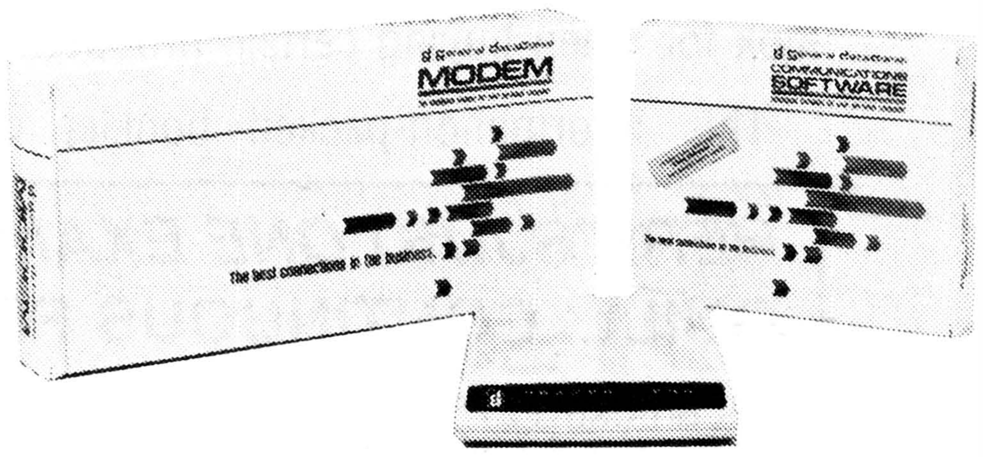

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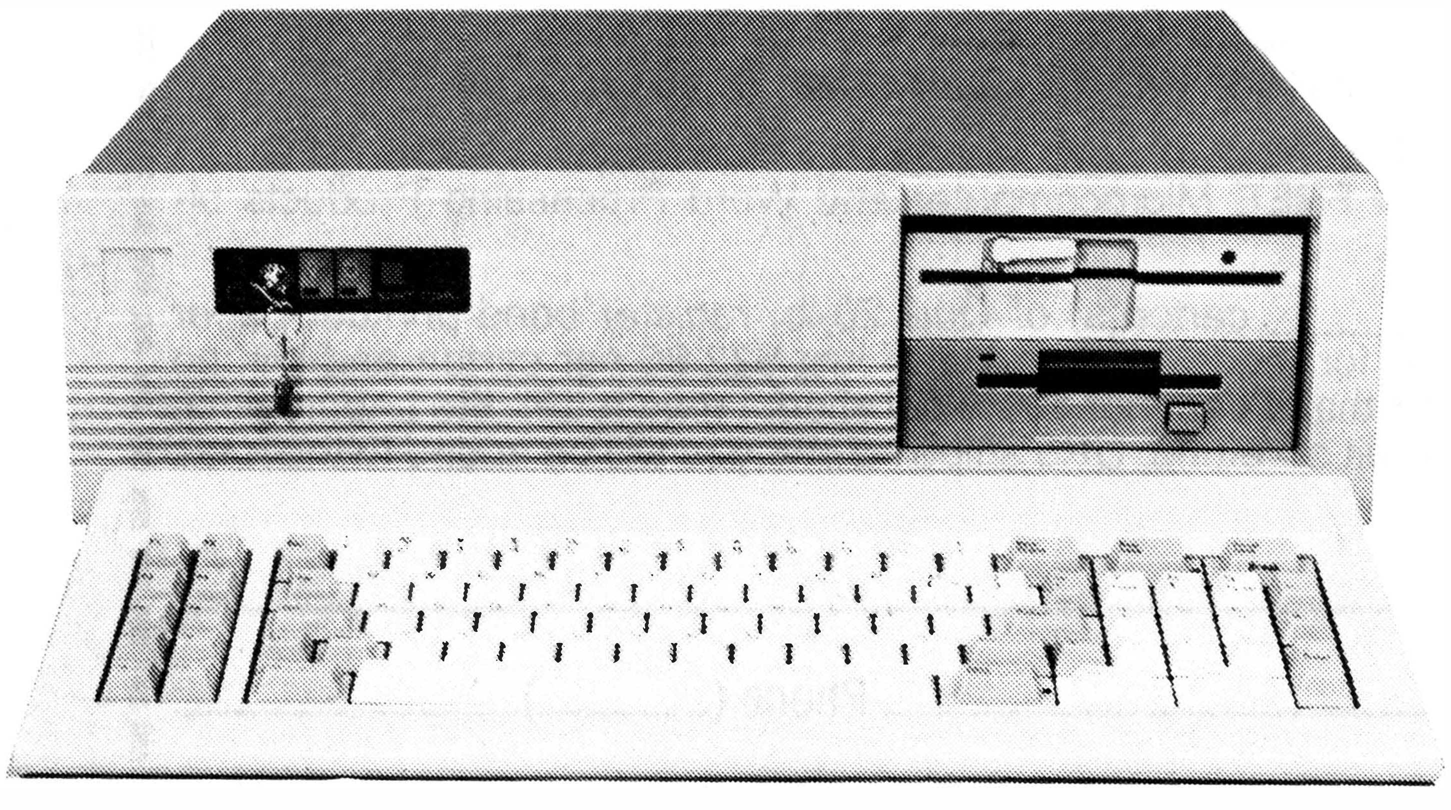

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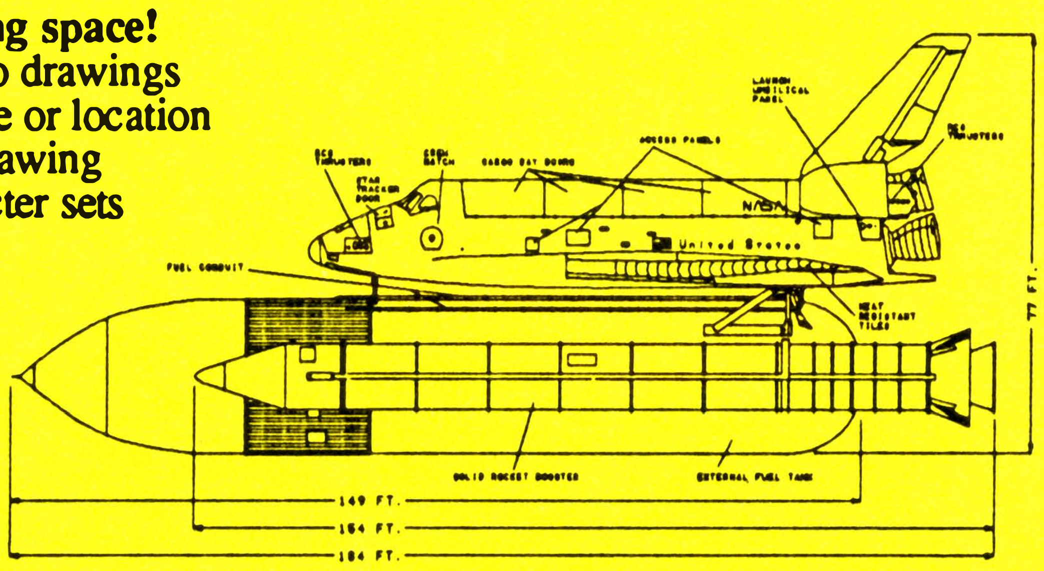
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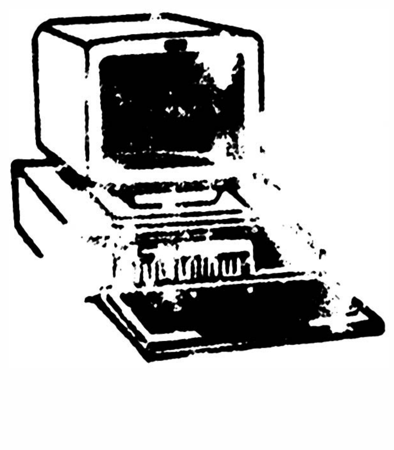

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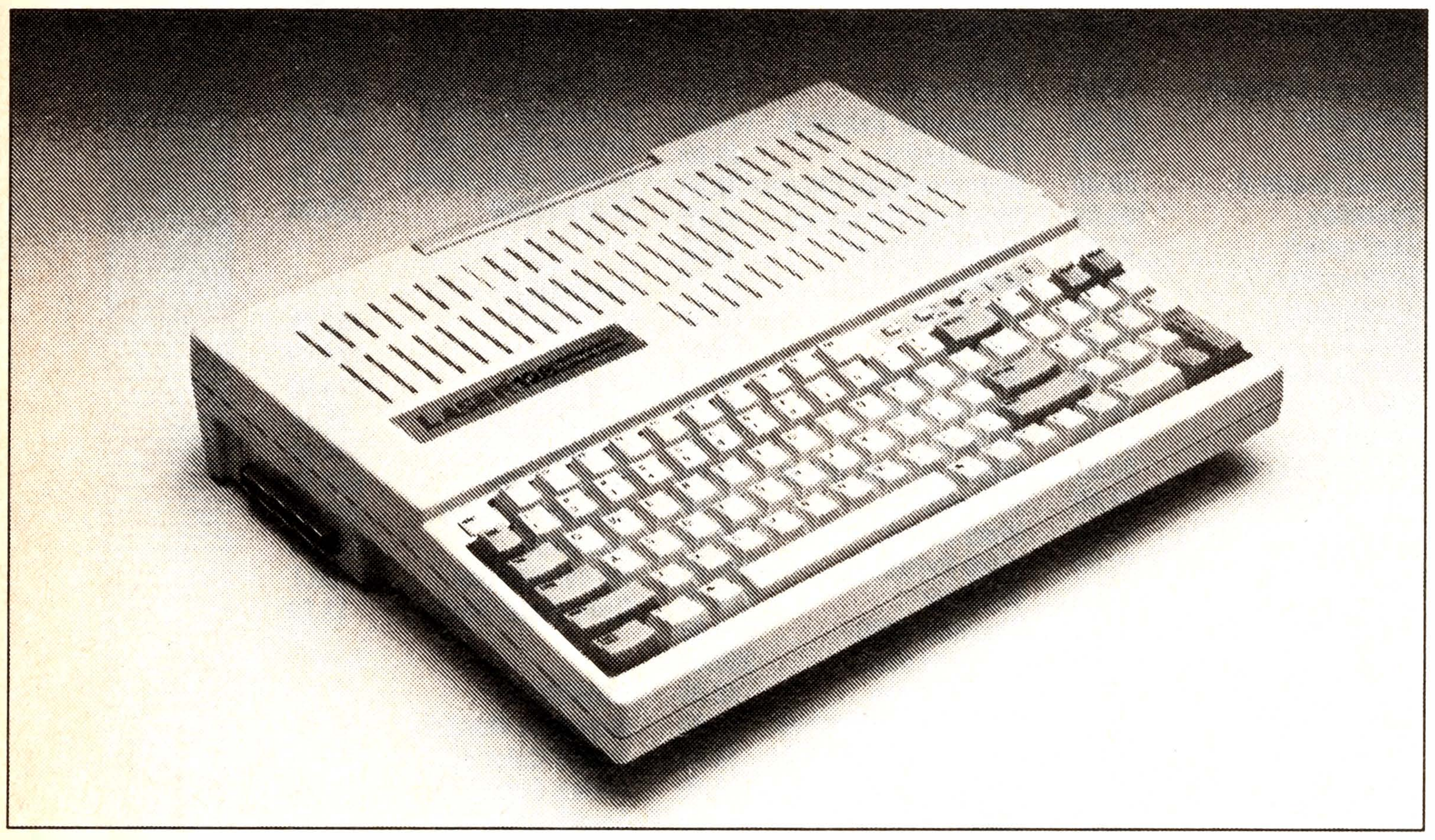

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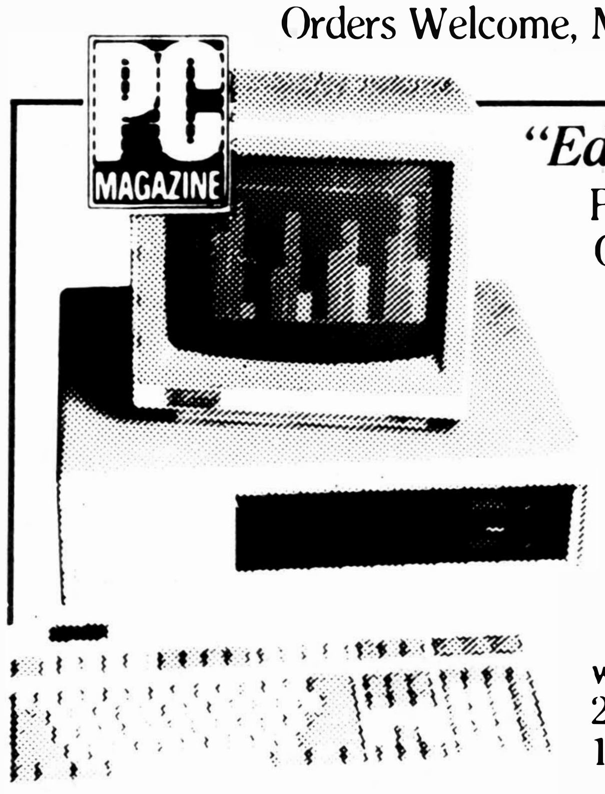

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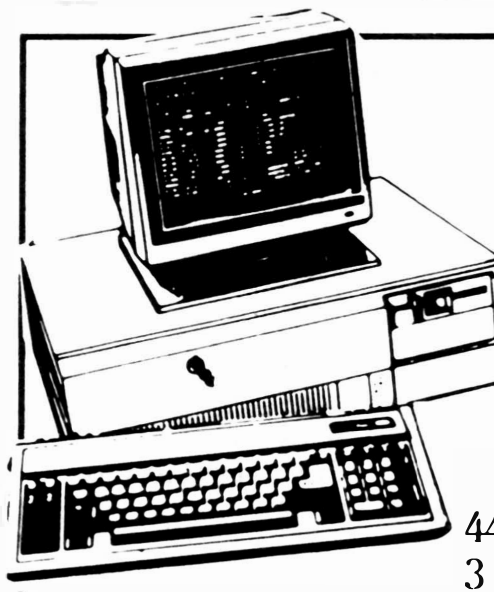

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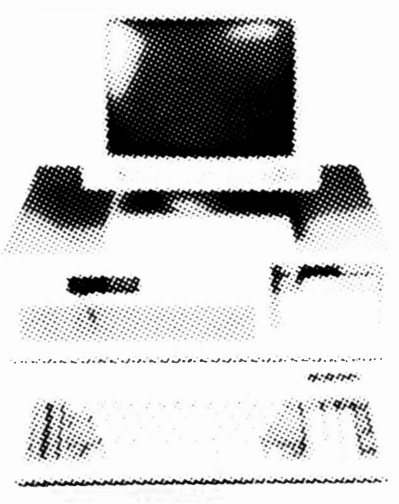

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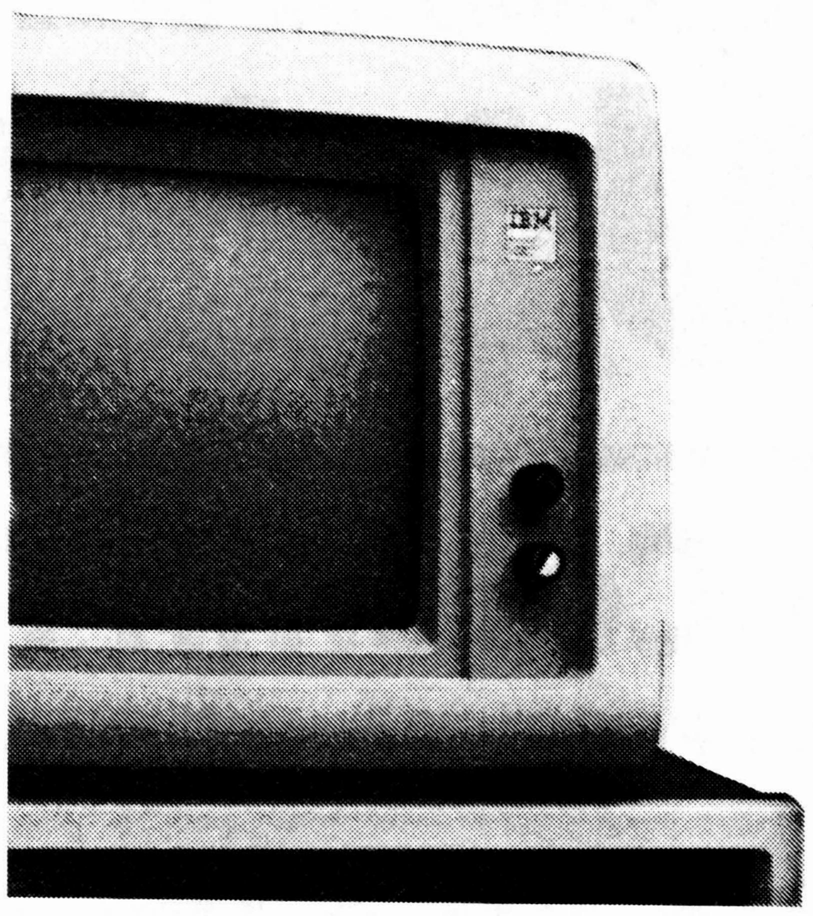
Is "The P.C." Really Necessary



and Does It Cost Too Much?

or

"How I Solved a Problem and Saved a Bundle Without Sacrificing Quality or Reliability." *by George Edward*

When I decided that a P.C. would help me, for my business and personal needs, I soon found out that I had opened up a new can of worms.

I started by investigating all the popular models that were offered by the numerous manufacturers and listened to all the claims made for them by the retail salesmen, and after two months I felt confused and discouraged.

Then I met a friend, Burt, who had done it all before and had solved the problem. He assured me it was quite simple and that most people tend to make it more complicated than was necessary. The first thing I must do, he said, was to ask myself, "Is a P.C. really necessary?" I told him briefly what I intended to do and Burt agreed that a computer would be a big asset to me.

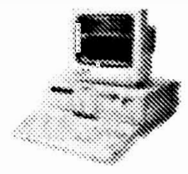
The next thing Burt told me came as a surprise, "Stop looking at hardware" he said. "Concentrate on finding the software you need, to make your computer do what you want it to do and when you've found it you will have completed the first step and it will greatly simplify the second and final step. "Only two steps?" He made it sound so easy. "Yes, it will be easy" he confirmed.

The second thing to do is choose from the hardware which will "run" the software you have found and your problem, of which one to buy, has gone away. Again, he was making it sound too easy so I asked him what he was using in his business. Burt found that the program for his needs had been intended for an IBM P.C. but he was running it on a Tandy Computer because not only was the Tandy reliable and less expensive than the IBM, but local help and service was available for the Tandy, plus he had been able to buy it at a big discount off the already lower-than-IBM price.

Since we all need to save money whenever possible I asked him where I could get the best price on the Tandy and he gave me the toll-free number of an outfit in Texas called "Fort Worth Computers (800-433-SAVE)," a company which is authorized to sell Tandy computers and printers, etc., with the manufacturer's limited warranty, which is honored at any Radio Shack Computer Center in America.

I soon found the software I was looking for, the Tandy 1000 SX, for only $729.00, would "run it" and I took delivery of the "SX" from the supplier by United Parcel Service only one week after I placed the order.

A bonus, that I was not expecting came with the computer. Fort Worth Computers informed me that I would get up to 30 days free help, to get my new system up and running, from my local "Radio Shack - Area Training and Support Office (A.T.S.O.)." This looks like it's going to be easier than I second thought.



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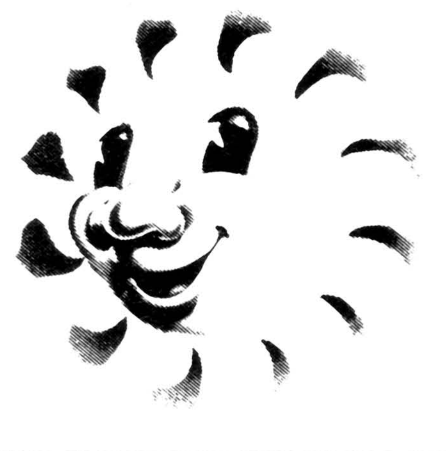

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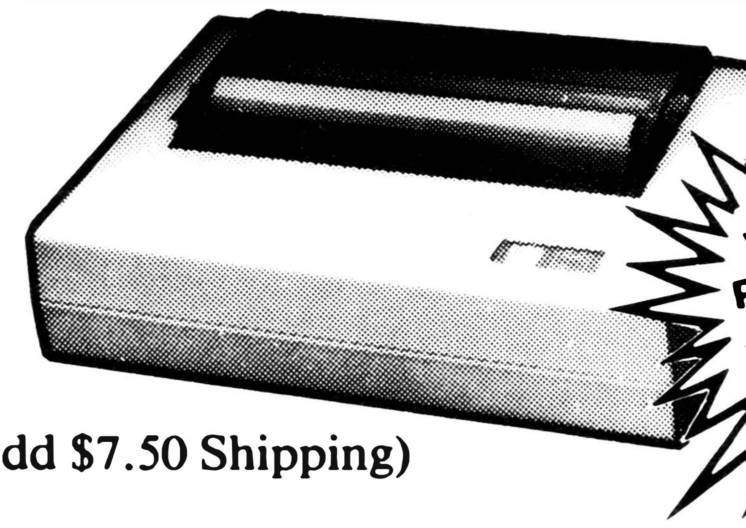

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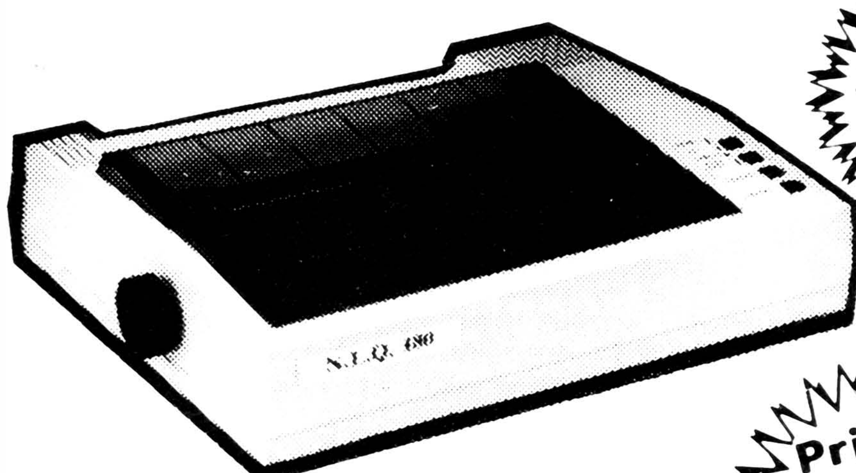

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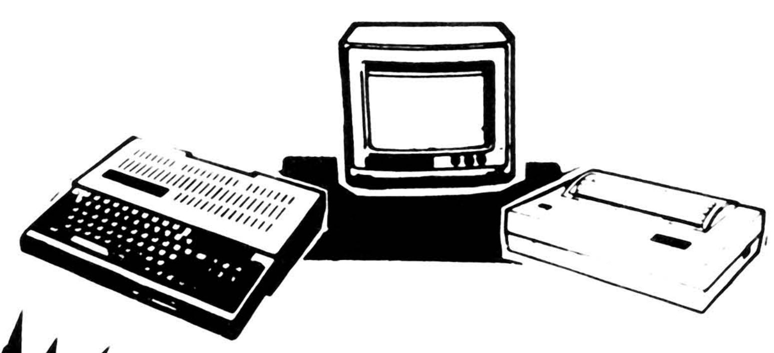

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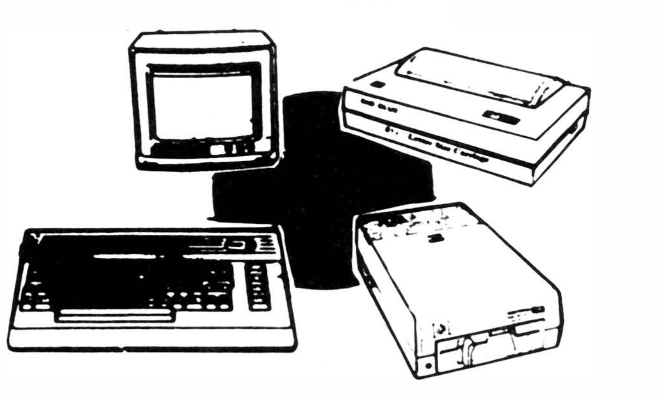

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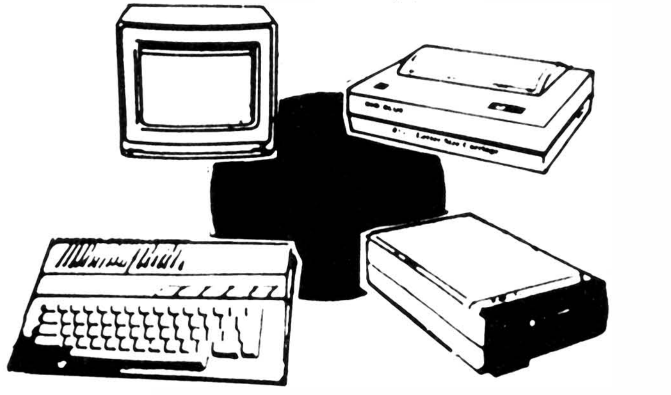

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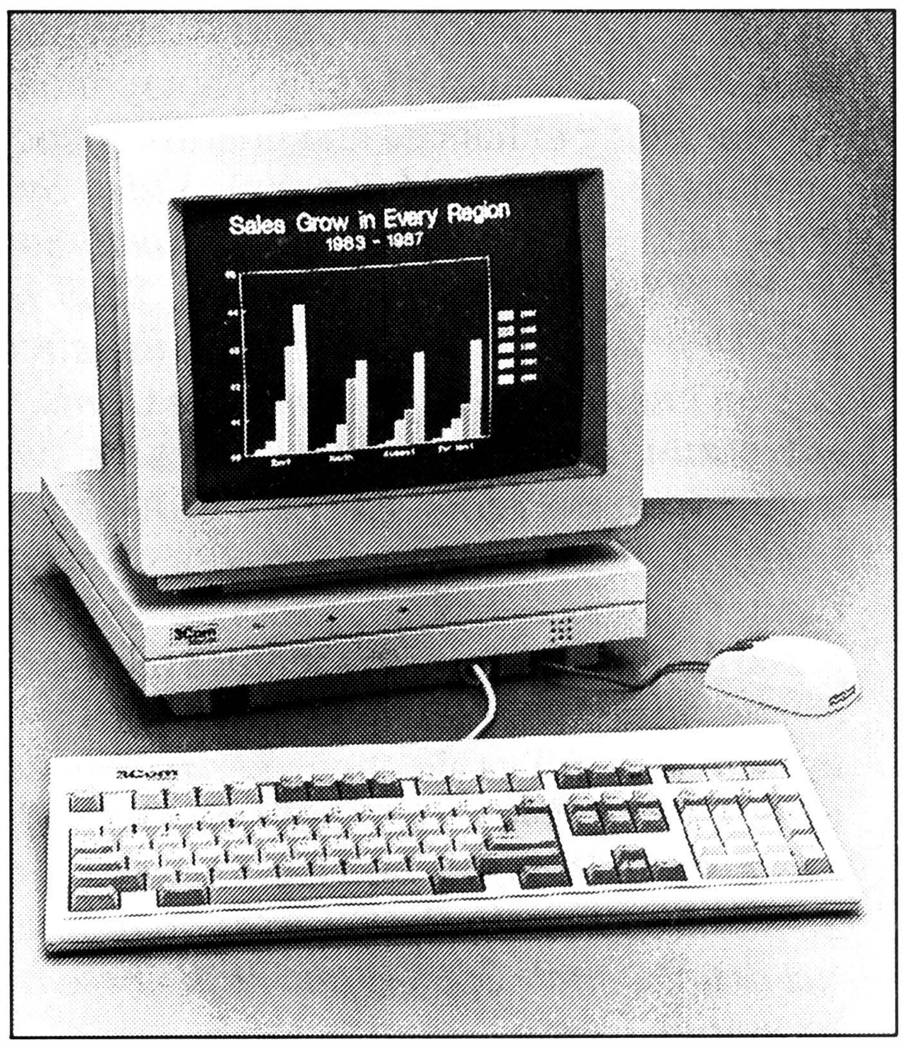
3Com's 80286-Based 3Station

SYSTEMS



The 3Station includes four graphics adapters.

3COM 3STATION, an IBM-compatible 80286-based Ethernet network station, can be integrated into a network with other PCs. The personal computer includes four graphics adapters (monochrome, Hercules, CGA, and EGA) and 1Mb of memory which can be upgraded to 4Mb. The 3Station measures 14- by 14- by 3-inches and comes with a 101-key keyboard; alternately, it can be used with any AT-compatible keyboard. *3Com Corp., 1365 Shorebird Way, Mountain View, CA 94043; (415) 961-9602; $1,895 retail. (For additional product details, circle 384 on one of the Free Information Cards.)*

BIOS MODEL G is a PC XT-style computer with 256k of RAM (which can be expanded to 640k), running at two clock speeds, 4.77 or 8MHz. The unit's standard features include four expansion slots for 8-bit boards, a switchable 110/220-volt 135-watt power supply, and a Hercules-compatible monochrome adapter. A CGA adapter, serial and parallels port are also included. *Silent Partner Corp., distributed by Distribution Plus, 7313 Grove Road, Frederick, MD 21701; (301) 695-5300; $895 retail. (For additional product details, circle 380 on one of the Free Information Cards.)*

HARRIS PC286 is a PC AT-compatible system based on a 16-bit 80286 processor running at 10MHz. Standard features include 640k of RAM, serial and parallel ports, a 1.2Mb disk drive, and a real-time clock with battery backup. Two versions of the base unit are available, one with a 20Mb and another with a 40Mb hard-disk drive. A second 40Mb internal hard-disk drive can be installed in the unit. *Harris Corp., 16001 Dallas Pkwy., Dallas, TX 75248; (214) 386-2000; $3,195 (base unit) retail. (For additional product details, circle 381 on one of the Free Information Cards.)*

MULTITECH 900 PC is a keyboard selectable 6/10MHz 80286-based IBM AT-compatible system. A 1.2Mb floppy disk drive included with the base unit occupies one of five 5.25-inch half-height spaces. A high-resolution monochrome monitor and monochrome graphics display adapter are included in the base unit. Two asynchronous, RS-232C serial ports also come standard. *Multitech Electronics, Inc., 401 Charcot Ave., San Jose, CA 95131; (408) 922-0333; $2,395 retail. (For additional product details, circle 379 on one of the Free Information Cards.)*

MULTITECH PC/1100 is an 80386-based system running at 16MHz. It has a 40Mb hard-disk drive and 1.2Mb floppy-disk drive and space for three additional half-height storage devices. The PC/1100 can be ordered with an 80Mb or 130Mb hard-disk drive. *Multitech Electronics, Inc., 1012 Stewart Drive, Sunnyvale, CA 94086; (408) 773-8400; $3,995 (40Mb model), $4,995 (80Mb model), and $6,895 (130Mb model), retail. (For additional product details, circle 382 on one of the Free Information Cards.)*

PLUS 700 PC is a dual-speed IBM-compatible system designed so users can choose between either standard 4.77MHz or 8MHz modes through keyboard commands. The Plus 700 comes with a high-resolution monochrome display and MultiGraphics color/monochrome display adapter. Also bundled in are MS-DOS 3.1 and a 97-key keyboard that features a separate numeric keypad. Six expansion slots and 640k of RAM are also standard. *Multitech Electronics, Inc., 401 Charcot Ave., San Jose, CA 95131; (408) 922-0333; $1,299 retail. (For additional product details, circle 383 on one of the Free Information Cards.)*

PERIPHERALS

105i HARD DISK is a storage device designed to provide up to 105Mb of internal storage for IBM PC, PC XT, and PC AT systems. It is fully compatible with the MS-DOS file structure and with all major networks. *Sunol Systems, Inc., PO Box 1777, 1177 Quarry Lane, Pleasanton, CA 94566; (415) 484-3322; $1,995 retail. (For additional product details, circle 351 on one of the Free Information Cards.)*

286 RAINBOW PLUS is an EGA/accelerator board designed to give PC users five functions from a single-slot board. It combines a 10MHz 80286 accelerator with 16k cache memory, a high-resolution Enhanced Graphics Adapter (EGA), and a battery backed-up clock/calendar as three of the standard functions. In the same expansion slot is an optional daughterboard with two additional functions, a parallel port and a Microsoft InPort mouse interface. The board also emulates a Color Graphics Adapter (CGA), Monochrome Display Adapter, and Hercules Graphics Card. *PC Technologies, Inc., 704 Airport Blvd., PO Box 2090, Ann Arbor, MI 48106; (313) 996-9690 or (800) 821-3086; $945 retail with EGA, accelerator and clock/calendar. The daughterboard with parallel port and mouse interface is $50 retail. (For additional product details, circle 352 on one of the Free Information Cards.)*

ALL CHARGECARD is a credit-card-size memory-manager board that plugs directly into the IBM PC AT motherboard, providing up to 16Mb of memory in either real or protected modes. With the addition of All Chargecard, the PC AT is able to operate in the standard 640k DOS or in an enhanced DOS of up to 960k while accessing up to 16Mb of DOS-compatible extended memory. *All Computers, Inc., 102 Bloor St. West, Suite 1200, Toronto, Ontario, Canada M5S 1M9; (416) 960-0111; $399 retail. (For additional product details, circle 353 on one of the Free Information Cards.)*

BULLET-286E is a replacement motherboard that contains an 80286 processor chip, a standard PC or PC XT expansion bus, and 1Mb of RAM. It uses disk caching techniques that are designed to increase disk I/O throughout by as much as 10 times without reducing user RAM. *Wave Mate, Inc., 2341 205th St., Torrance, CA 90501; (213) 533-8190; $395 (either PC or PC XT versions), retail. (For additional product details, circle 354 on one of the Free Information Cards.)*

CLX96DP MODEM is a 9600-bits-per-second (bps) synchronous modem for use over dial-up or dedicated telephone lines. The modem, which features Automatic Adaptive Equalization (AAE), operates in half-duplex mode on dial-up lines and half- or full-duplex mode on dedicated lines. The modem is available in either stand-alone or rack-mount models; each features a set of front panel, LED status indicators that alert the user when line quality falls below an acceptable level. Fallback transmission rates

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of 7200 or 4800 bps may be selected from the front panel. *Okidata, 532 Fellowship Road, Mount Laurel, NJ 08054; (609) 235-2600; $1,495 retail. (For additional product details, circle 355 on one of the Free Information Cards.)*

COLOR PURE is a graphics card for CGA monitors offering 16 colors and resolution of 640-by-200. A parallel printer port is included on the half-size card. *Tatung Company of America, Inc., 2850 El Presidio St., Long Beach, CA 90801; (213) 637-2105 or (213) 979-7055; $119 retail. (For additional product details, circle 356 on one of the Free Information Cards.)*

COMBO CARD is a graphics adapter designed to run on 25KHz monitors. It features CGA compatibility with RGB monitors, and Hercules and MDA compatibility with monochrome monitors. The standard adapter has a parallel printer port. *Tatung Company of America, Inc., 2850 El Presidio St., Long Beach, CA 90801; (213) 637-2105 or (213) 979-7055; $199 retail. (For additional product details, circle 357 on one of the Free Information Cards.)*

DELUXE EGA is a graphics board with a resolution of 752-by-410, 640-by-480, or 896-by-350 pixels. The board is designed to draw as many as 16 colors from a palette of 64 and supports all features of the IBM EGA, CGA, and PGA. It also provides for keyboard switching when changing from EGA to CGA. The Deluxe EGA is compatible with monochrome and color-display monitors including enhanced and multifrequency displays (e.g., NEC Multisync). *Vutek Systems, Inc., 10855 Sorrento Valley Road, San Diego, CA 92121; (619) 587-2800; $559 retail. (For additional product details, circle 358 on one of the Free Information Cards.)*

DUAL SERIAL ADAPTER BOARD combines two asynchronous serial ports on a single board. It features two independent serial connectors and enables users to connect serial devices, such as a modem, a mouse or a laser printer, to their systems. The adapter provides AT-style 9-pin serial connectors. *STB Systems, Inc., 1651 N. Glenville, Suite 210, Richardson, TX 75081; (214) 234-8750; $149 retail. (For additional product details, circle 359 on one of the Free Information Cards.)*

EGA BY BOCA is an enhanced graphics board designed to provide all the capabilities of the IBM EGA card as well as compatibility to the Hercules Graphics Card, CGA (Color Graphics Adapter), and Monochrome Display Adapter. It includes 256k and offers 16 colors from a palette of 64 at 640-by-350 pixel resolution. *Boca Research, Inc., 6401 Congress Ave., Boca Raton, FL 33431; (305) 997-6227; $199 retail. (For additional product details, circle 360 on one of the Free Information Cards.)*

EGA MASTER 480 and **EGA MASTER 800** are half-size boards designed to provide 100 percent software compatibility with the popular graphics modes: IBM EGA, CGA, and Hercules. The EGA Master 480 will display 640-by-480 resolution in 16 colors on a multiple scanning frequency monitor. The EGA Master 800 will display up to 800-by-600 resolution in 16 colors on a multiple scanning frequency monitor, such as the NEC Multisync. Both boards will be shipped with 800-by-600 software drivers for AutoCAD, GEM, and Microsoft Windows. *Tecmar, Inc., 6225 Cochran Road, Solon, OH 44139-3377; (216) 349-0600; $495 (Master 480), $595 (Master 800), retail. (For additional product details, circle 361 on one of the Free Information Cards.)*

FACIT C7400 PRINTER is a 400 characters-per-second (cps) dot matrix printer designed to interrupt fanfold paper printing in order to feed single-cut sheets. The unit will reload the fanfold paper and resume printing without any manual paper handling. It is capable of printing near-letter-quality characters (NLQ) at 100 cps. The Facit C7 can emulate Epson FX/JX (standard) and IBM Graphics Printer commands, and has both serial (RS-

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(For More Information Circle 111)

232) and Centronics parallel interfaces that can be changed. Paper paths are built into the C6400: from the back of the printer, using a push/pull tractor or pushing tractors; and from the bottom, using pulling tractors. *Facit, Inc., 9 Executive Drive, Merrimack, NH 03054; (603) 424-8000; $1,995 retail. (For additional product details, circle 362 on one of the Free Information Cards.)*

GENESIS 1024 is a graphics board that features 384k of video memory and 1.5Mb of programmable memory. The board is designed to drive most analog or digital monitors. It delivers resolutions up to 1024-by-768 at 4096 colors. *National Design, Inc., 12885 Research Blvd., Suite 105, Austin, TX 78750; (512) 454-4007; $1,700 retail. (For additional product details, circle 363 on one of the Free Information Cards.)*

HANDSCAN OCR is a hand-held scanner that can be attached to IBM PCs and compatibles and can read typewritten or laser-printed reports and dot-matrix printouts. Handscan works with software programs such as Lotus 1-2-3, dBase III, R:Base 5000, WordStar, WordPerfect, and MultiMate. Handscan comprises a scanner, an interface board, and software. A computer with 640k and a hard disk is recommended. *Saba Technologies, Inc., 9300 SW Gemini Drive, Beaverton, OR 97005; (503) 222-7050; $649.95 retail. (For additional product details, circle 364 on one of the Free Information Cards.)*

For more product information, please circle the appropriate number on one of the Free Information Cards that are located facing the Product Index within the product review section or opposite the Advertiser's Index.

JET 386 is a single-slot 80386-based accelerator card designed to improve the processing speed of IBM ATs and compatibles threefold. A 64k-cache memory enables programs to run faster when a user slides the Jet 386 into an expansion slot, removes the 80286 from the motherboard and plugs it into a socket on the Jet 386, and then interconnects the Jet 386 with the motherboard's 80286 socket using the cable provided. *Orchid Technology, 47790 Westinghouse Drive, Fremont, CA 94539; (415) 490-8586; $1,199 retail. (For additional product details, circle 365 on one of the Free Information Cards.)*

LASERVIEW DISPLAY SYSTEM, in either 15- or 17-inch versions, are two high-resolution monitor/display adapter systems for the Macintosh SE. The 15-inch version provides 1664-by-1200 pixel resolution. The scan frequency for both is 75KHz and the refresh rate is 60Hz, features which are designed to provide flickerless display. Users can select either the default display of 1664-by-1200, or the standard Macintosh linear resolution of 72 dots per inch. In this mode the resolution is 832-by-600. *Sigma Designs, Inc., 46501 Landing Parkway, Fremont, CA 94538; (415) 770-0100; $1,795 (15-inch), $2,295 (19-inch), retail. (For additional product details, circle 367 on one of the Free Information Cards.)*

MEGASCREEN SE and **MEGASCREEN SE*M** are large-screen monitors for the Macintosh SE. Both monitors are 19.5 inches high and come bundled with the MegaScreen SE or MegaScreen SE*M interface card, detachable cable, and MegaScreen System 7 software. The software incorporates cursor control; shortcut commands to access MegaScreen features, and user-definable video image controls for pixel shape. *MicroGraphic Images Corp., 20954 Osborne St., Canoga Park, CA 91304; (818) 407-0571; $1,995 (either monitor), retail. (For additional product details, circle 368 on one of the Free Information Cards.)*

MINI-MICROSPOOLER offers 64k of buffering memory and can hold up to 20 pages of typewritten text. Four models are available, parallel to parallel, parallel to serial, serial to parallel, and serial to serial. The power supply is self-contained. *Consolink Corp., 1275 S. Sherman Drive, Longmont, CO 80501; (800) 525-6705; $199 (all models), retail. (For additional product details, circle 369 on one of the Free Information Cards.)*

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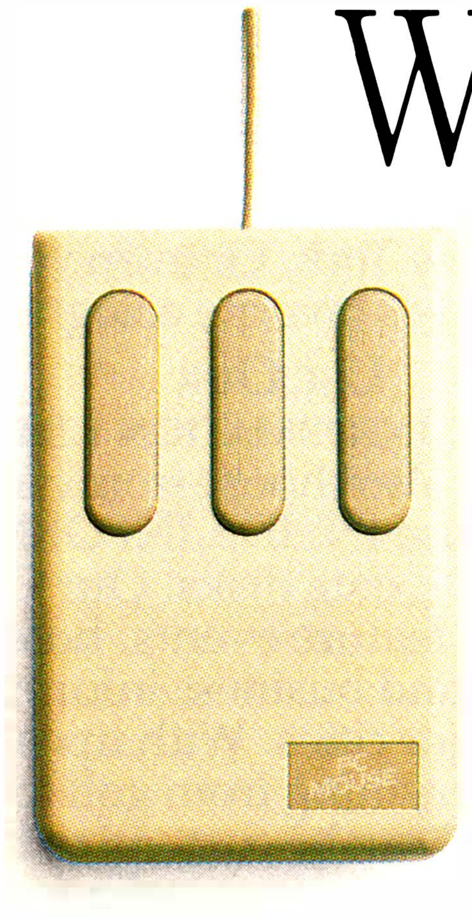
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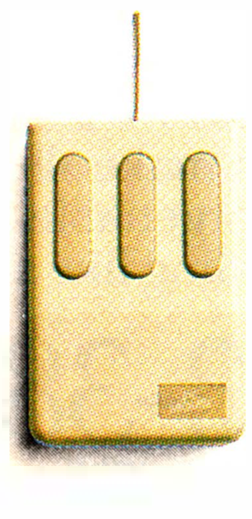
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MYLEX 386-A BOARD is a PC AT-system motherboard that uses the Intel 80386 microprocessor. The 386-A runs at speeds of up to 16MHz, and is available with 1- or 4Mb of on-board 32-bit RAM and an optional 80287 coprocessor. The standard configuration includes six 16-bit and two 8-bit expansion slots and 64k of cache memory. *Mylex Corp., 5217 NW 79th Ave., Miami, FL 33166; (305) 592-9669; $1,900 retail. (For additional product details, circle 370 on one of the Free Information Cards.)*

NP-2405 PRINTER is a 24-wire dot matrix printer with a three-way paper feed system and a liquid crystal display screen for presetting of print configurations. The NP-2405 offers nine resident fonts and seven optional font cartridges, print speeds of 250 to 428 cps in draft mode and 80 to 144 cps in letter quality mode. It enables users to preconfigure all print settings, including fonts, page and line length, pitch, and margins. Standard emulation for the NP-2405 is Epson LQ-1500; Diablo 630 emulation is optional. In addition, modular interfaces are available, including Centronics Parallel, Centronics Parallel with 30k buffer, and RS-232C Serial with a 30k buffer. *Nissho Information Systems, 10855 Business Center Drive, Suite 100, Cypress, CA 90630; (714) 952-8700; $1,295 retail. (For additional product details, circle 371 on the Free Information Card.)*

P321SL PRINTER, a 24-pin dot-matrix printer, comes standard with a tractor for fanfold paper and IBM emulation. The tractor with automatic fanfold enables users to print on cut-sheet paper without removing the tractor-feed paper. The P321SL has no dip switches (printing modes are chosen by the touch-controls on the front panel) and prints at 216 cps in high-speed draft mode and 72 cps in letter-quality mode. *Toshiba America, Inc., Information Systems Division, 9740 Irvine Blvd., Irvine, CA 92718; (800) 457-7777; $749 retail. (For additional product details, circle 372 on one of the Free Information Cards.)*

PALETTEPLUS COMPUTER IMAGE RECORDER delivers high-resolution full-color instant prints, slides, and overheads from IBM-compatible systems using EGA boards. It can produce 640-by-700 pixel resolution printed copy with an EGA-equipped computer and software with a PalettePlus driver. (Software without a PalettePlus driver will produce 640-by-350 pixel resolution.) The Image Recorder comes with the Polaroid Palette version 4.0 software, a Polaroid 3.25- by 4.25-inch film back, auto-wind 35mm camera back, Polaroid 35mm power processor, an illuminated slide mounter, and cables. *Polaroid Corp., 575 Technology Square, 9P, Cambridge, MA 02139; (617) 577-3796; $2,999 retail. (For additional product details, circle 373 on one of the Free Information Cards.)*

PHD FIXED DISK, an 82Mb removable/fixed-disk subsystem for the Macintosh II, Macintosh SE, or Macintosh Plus, is designed for fast-access times (25 millisecond) and fast backup capability (20.5Mb in 90 seconds). It contains four 8-inch disk platters on a single spindle, one of which is removable as an ANSI (American National Standards Institute) standard cartridge. *Century Data Systems, Amcodyne Division, 1301 South Sunset St., Longmont, CO 80501; (303) 772-2601; $5,495 retail. (For additional product details, circle 374 on one of the Free Information Cards.)*

PRODIGY SE BOARD is an enhancement board for the Macintosh SE. It plugs into the SE-Bus slot (internal expansion bus) on the Macintosh SE motherboard. The configuration of the SE board features a 16MHz, 32-bit CPU, 1Mb of RAM, a built-in, nonvolatile RAM disk, and two on-board expansion ports. The Prodigy SE's 68020 enables the Macintosh SE to run as fast as the Macintosh II. On-board expansion options available for the Prodigy SE include a floating point math coprocessor (16MHz Motorola 68881), and 2-, 4-, or 8Mb of memory. *Levco, 6160 Lusk Blvd., Suite C-203, San Diego, CA 92121, (619) 457-2011; $1,995 retail. (For additional product details, circle 375 on one of the Free Information Cards.)*

R-CARD 45 HARD DISK is an internal hard-disk card for the IBM PC, PC XT, PC AT, and

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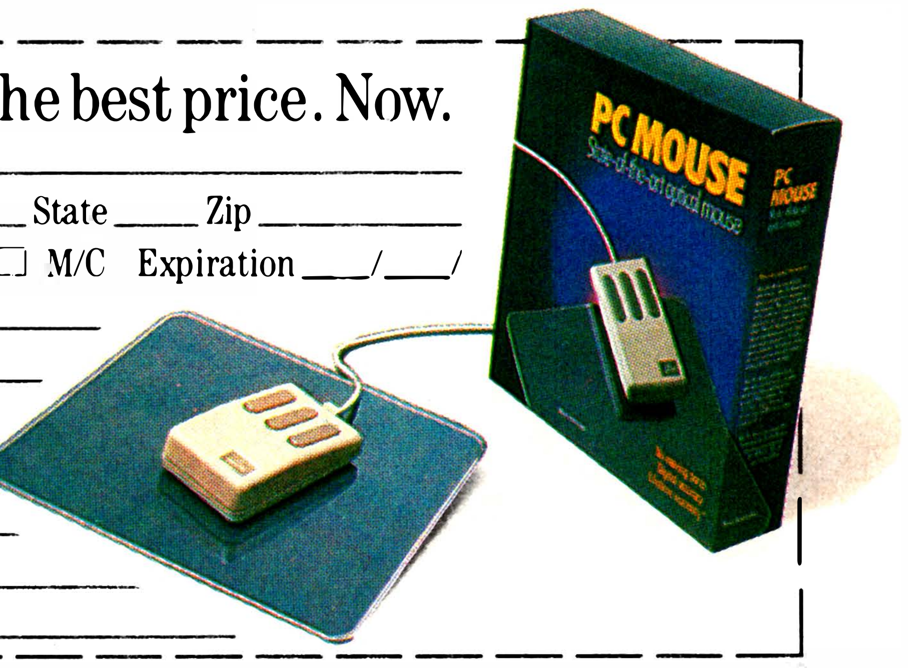


Personal System/2 Model 30. The card comes with software for PC XT, PC AT or PS/2 Model 30 operations. Both 5.25-inch and 3.5-inch disks are provided. It can be installed into any of the PS/2 Model 30's three slots. The R-Card 45 provides 45Mb of storage. *Rodime, Inc., Peripheral Systems Division, 29525 Chagrin Blvd., Suite 214, Pepper Pike, OH 44122; (216) 765-8414; $1,495 retail. (For additional product details, circle 376 on one of the Free Information Cards.)*

TURBO TOUCH 1302 MONITOR is a Sony multiscan color monitor with automatic switching between CGA, EGA, and PGA graphics modes. The 13-inch monitor features a Trinitron picture tube and a cylindrical screen for color intensity. The 1302 Monitor has a display resolution of 900-by-560 and will adjust to almost any video card. *Personal Touch Corp., 4320-290 Stevens Creek Blvd., San Jose, CA 95129; (408) 246-8822; $1,100 retail. (For additional product details, circle 377 on one of the Free Information Cards.)*

ULTRASYNC MONITOR is a 12-inch diagonal high-resolution RGB color monitor with a 15mm-by-160mm display area. It is compatible with EGA, CGA, PGC, monochrome, Color 400, and all IBM-compatible multifunction boards. The monitor offers green/amber, blue/white color changes, and automatic sizing for consistent screen display. Eight, 16, or 24 colors are featured in digital mode and an infinite color palette in analog mode. The standard Ultrasync monitor comes with a built-in tilt/swivel base. *Princeton Graphic Systems, 601 Ewing St., Bldg. A, Princeton, NJ 08540; (609) 683-1660; $795 retail. (For additional product details, circle 378 on one of the Free Information Cards.)*

MISCELLANEOUS

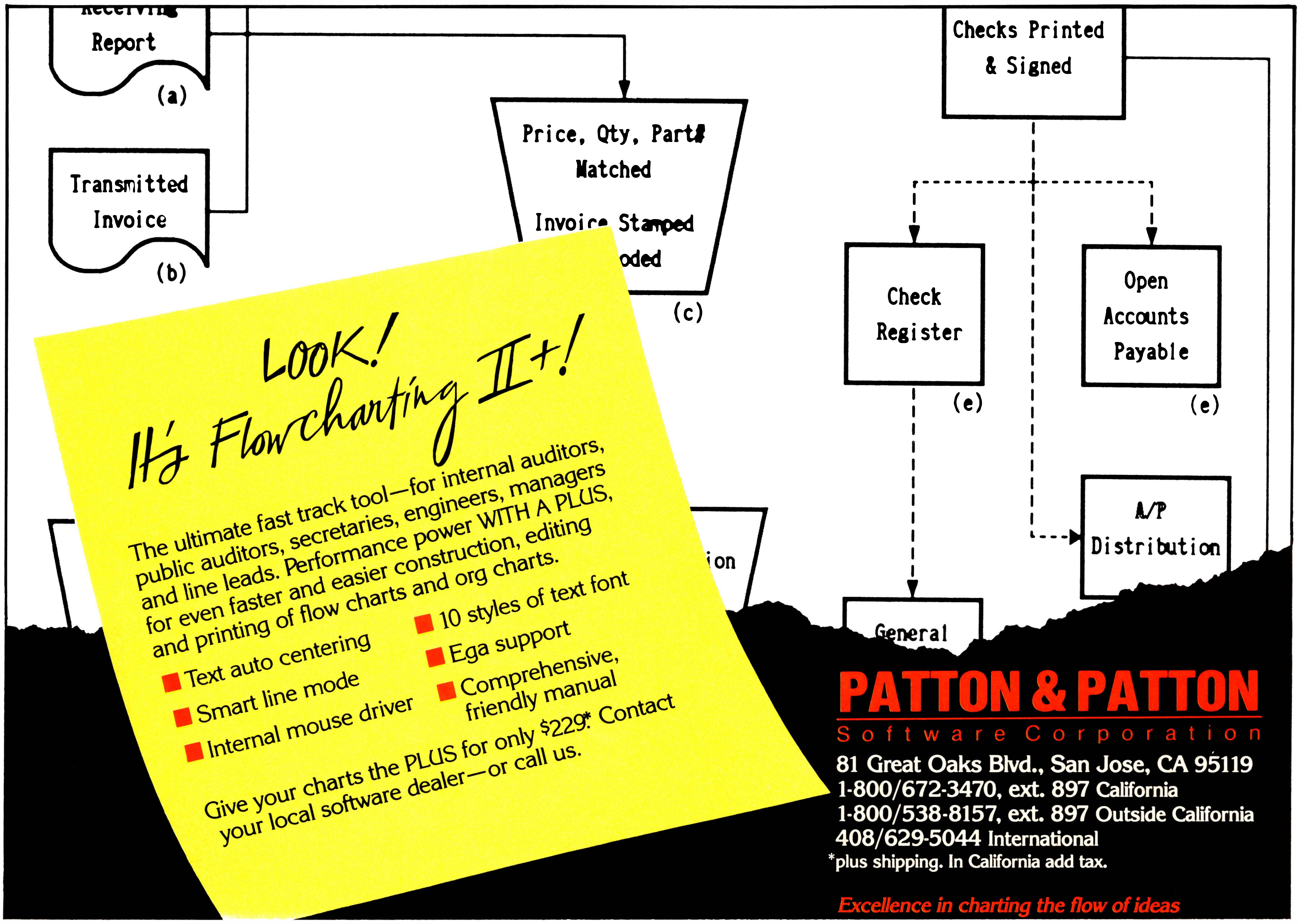
CURTIS 5.25-INCH FILE, is a rack for warehousing up to 50 5.25-inch floppy disks. Made of beige plastic, it features adjustable dividers with color-coded labels. A hinged cover with a ledge at the front holds three disks for quick reference. The built-in handle has a push-button, nonmagnetic lock. *Curtis Manufacturing Co., Inc., 305 Union St., Peterborough, NH 03458; (603) 924-3821; $9.95 retail. (For additional product details, circle 385 on one of the Free Information Cards.)*

DROPKICK CPU STAND is designed to hold a system unit in a vertical position on the floor. It is made of welded steel with support brackets that feature a protective vinyl coating. Dropkick is available in three sizes to fit the IBM PC XT, PC AT, and Wang systems. *LinTek Computer Accessories, 426 North Park NE, Grand Rapids, MI 49505; (800) 822-9110; $79.95 retail. (For additional product details, circle 386 on one of the Free Information Cards.)*

KEYBOARD AND DISK DRIVE DUST COVERS are designed for the IBM PC XT 286. They are made of textured styrene and are lined with vinyl foam for a dirt-proof seal. The covers can be purchased as a set or individually. *MicroComputer Accessories, Inc., PO Box 66911, 5405 Jandy Place, Los Angeles, CA 90066-0911; (213) 301-9400; $19.95 (set), $10.95 (keyboard cover), $9.00 (disk drive cover), retail. (For additional product details, circle 387 on one of the Free Information Cards.)*

LASERFEEDER II is a sheet feeder for Hewlett-Packard's LaserJet Series II printer. The feeder supplies two paper bins (220-sheet capacity each) and an envelope bin that holds 40 to 60 envelopes. *BDT Products, Inc., 17152 Armstrong Ave., Irvine, CA 92714; (714) 660-1386; $1,695 retail. (For additional product details, circle 388 on one of the Free Information Cards.)*

NETWORX A-B SWITCHBOX is an RS-232 connection device designed to link a PC with a modem and printer even if the PC has only one serial port. It includes one input and two output connectors located on the rear panel, and a two-position lever on the front. The user connects the switchbox to the serial port and then connects two serial devices to the box's output connectors.



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(For More Information Circle 128)

Networx, 1913 Atlantic Ave., Manasquan, NJ 08736; (201) 223-9400; $99.95 retail. (For additional product details, circle 389 on one of the Free Information Cards.)

PHONE LINE RFI SUPPRESSORS are designed to protect modems against RFI interference generated by radios, TVs, or CB units. *Electronic Specialists, Inc., 171 South Main St., Natick, MA 01760; (617) 655-1532; $30 retail. (For additional product details, circle 390 on one of the Free Information Cards.)*

PRINTER MUFFLERS are printer sound covers designed for dot matrix printers. The mufflers are available in two sizes: The Printer Muffler 80 fits most 80-column printers (19-by-16.25-by-6 inches); The Printer Muffler 132 fits most wide-carriage printers (25-by-17-by-8 inches). *Kensington Microware Ltd., 251 Park Ave. South, New York, NY 10010; (212) 475-5200; $59.95 (Muffler 80), $79.95 (Muffler 132), retail. (For additional product details, circle 391 on one of the Free Information Cards.)*

PRODUCTIVITY

ABILITY PLUS is a five-function integrated package for IBM Personal Computers and compatibles that includes a relational data base, a spreadsheet, a full-feature word processor, a graphics module, and telecommunications capabilities. The program includes a spelling checker, the ability to create and save macros, and a library screen navigation system that enables users to shift between applications. It provides import/export facilities. In addition, the program's dynamic linking feature will automatically update data that is common to two or more applications when changes are made. The memory requirement is 512k; 640k is recommended. *Migent, Inc., 865 Tahoe Blvd., Incline Village, NV 89450; $89 retail. (For additional product details, circle 453 on one of the Free Information Cards.)*

ACCOUNTING SYSTEM/2 is a new series of 11 accounting modules intended for use on the IBM Personal System/2. The modules in the series include: Accounts Receivable, Accounts Payable, General Ledger, Payroll, Order Entry/Billing, Inventory Control, Sales Analysis, Job Cost, Purchase Order, and the newest module, Check Reconciliation. Each module includes on-line help and auditing capabilities. The package supports single and multiple users. The memory requirement is 256k. *RealWorld Corp., 282 Loudon Road, PO Box 2051, Concord, NH 03302; (603) 224-2200; $695 (per module), retail. (For additional product details, circle 454 on one of the Free Information Cards.)*

ACCOUNTMATE 1.2, the accounting software package, has updated its Multi-State Payroll module, which processes payment, withholdings, and deductions for an unlimited number of salaried, hourly, and timecard employees. Multi-State Payroll can now maintain tax routines for up to 50 states, and prints reports that include W-2, 940, 941, and 1099 forms. Multi-State Payroll is available for single- or multiuser environments. The memory requirement is 256k. *SourceMate Information Systems, Inc., 20 Sunnyside Ave., Mill Valley, CA 94941; (415) 381-1011; $495 (single-user module), $695 (multiuser module) (add $100 for each state payroll program), retail. (For additional product details, circle 551 on one of the Free Information Cards.)*

ALLEGORY 2.0 is a Wang-like word processor that makes mail-merge capabilities available using Allegory documents and standard text files. Two documents can now be edited simultaneously, in either full- screen or split-screen mode. DOS can be accessed directly from within Allegory. The program currently supports 150 printers. Those whose printers are not yet supported can receive a driver at no extra charge from April Software. The memory requirement is 384k. *April Software, Inc., 429 F Street, Suite 9, Davis, CA 95616; (916) 758-8088; $99*

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Allow user to run any program while within another	YES	NO
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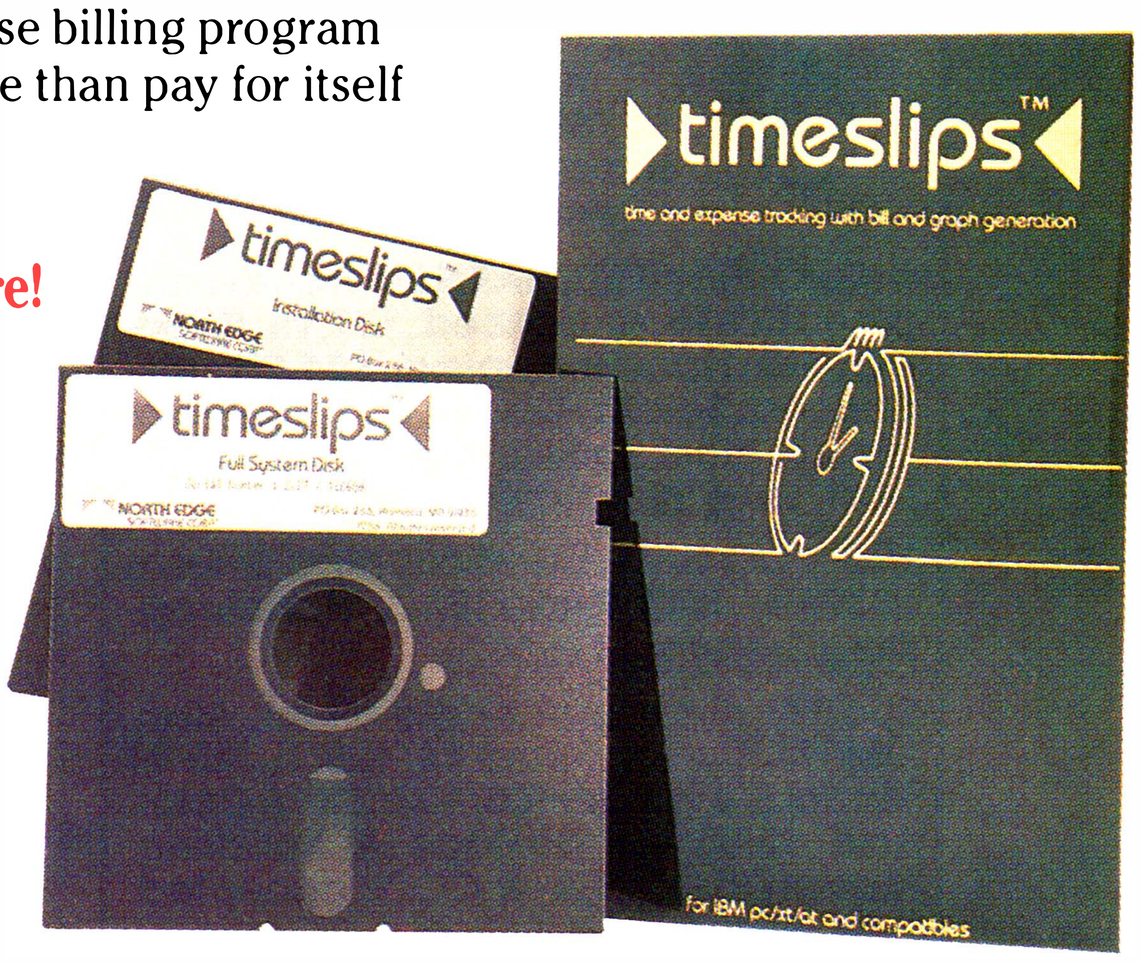

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SYSTEM INFORMATION: IBM PC/XT/AT or compatibles with 2 floppy disks or 1 floppy disk and a hard disk and 384Kb of RAM required. TIMESLIPS uses 49K while memory-resident.

retail. (For additional product details, circle 552 on one of the Free Information Cards.)

BOS BUSINESS ACCOUNTING is an integrated, double-entry accounting package intended for small-business users. BBA integrates General Ledger, Accounts Payable, Accounts Receivable, Sales and Inventory, and Payroll. The program is menu-driven and designed for beginning users. The memory requirement is 512k. *Aristo Computers, 16811 El Camino Real, Suite 213, Houston, TX 77058; (713) 480-6288; $495 retail. (For additional product details, circle 553 on one of the Free Information Cards.)*

CD/INTERNATIONAL is a financial data base in the CD-ROM format that contains detailed information on more than 4,000 corporations, 2,000 of which are based in the United States. The product also provides information on companies in 24 foreign countries and in 25 different industries. The information in the Wordscope data base includes business descriptions, financial statements, accounting practices, and an extensive catalog of other financial data and company statistics. The memory requirement is 640k; an IBM PC XT or PC AT is also required. *Datext, Inc., 444 Washington St., Woburn, MA 01801; (617) 938-6667; $19,500 (annual subscription fee; also includes CD-ROM drive, software, monthly data base updates), direct order. (For additional product details, circle 455 on one of the Free Information Cards.)*

CHEMTEXT 1.1, the most recent release in the Chemist's Personal Software Series, is a scientific/chemical word processor that enables users to create and integrate text with chemical structures, reaction diagrams, equations, and flowsheets to create presentation-quality reports. New features of the program include: the ability to rotate a group 180-degrees in the Molecule Editor; selectable fonts from the main menu, including Helvetica, in sizes from 6 to 48 points; and the addition of Macro Abandon-Condition and Macro Input to the program's existing macro capabilities. The memory requirement is 640k. *Molecular Design Ltd., 2132 Farallon Drive, San Leandro, CA 94577; (415) 895-1313; $1,500 retail. (For additional product details, circle 456 on one of the Free Information Cards.)*

CONSTRUCTION SOLUTION is a new collection of accounting software intended to meet the specialized accounting needs of the construction industry. This family of products, of which Construction Solution is the first, is intended to address the accounting requirements of specialized industries. The accounting modules include Job Costing, General Ledger and Financial Reporter, Accounts Payable, Accounts Receivable, Payroll, Inventory Control and Analysis, and EasyFiler and Report Writer. The optional window program, EasyPlus Windowing System, is available to enable users to easily move between modules and exchange data between separate modules. The package supports the IBM Personal System/2, IBM PC, PC XT, and PC AT. Both 3.5-inch and 5.25-inch disks are included. The memory requirement is 256k (512k when used with the EasyPlus Windowing System). *Computer Associates International, Inc., 2195*

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Fortune Drive, San Jose, CA 95131; Job Costing ($795), General Ledger and Financial Reporter ($695), Accounts Payable ($695), Accounts Receivable ($695), Payroll ($795), Inventory Control and Analysis ($595), EasyFiler and Report Writer ($195), and EasyPlus Windowing System ($149), retail or direct order. (For additional product details, circle 457 on one of the Free Information Cards.)

DESQVIEW 2.0, the most recent version of Quarterdeck's multitasking operating system, has added support for IBM's Personal System/2, the video graphics array (VGA) display, and the 3.5-inch disk format. (The program is also available in the 5.25-inch disk format.) Desqview 2.0 will also run on 8088-, 8086-, 80286-, and 80386-based systems, and is also capable of running Windows-, GEM-, and TopView-specific programs. The program enables multitasking within 640k and beyond 640k on personal computers with enhanced expanded memory, or on 386 machines. The memory requirement is 640k. *Quarterdeck Office Systems, 150 Pico Blvd., Santa Monica, CA 90405; (213) 392-9851; $129.95 retail. (For additional product details, circle 458 on one of the Free Information Cards.)*

FOX 10-BASE 3.0, the new version of the data base management system that is now compatible with DOS 3.1 includes an expanded report generator, color support, and record locking and file sharing features. The memory requirement is 256k. *Fox Research, Inc., 7016 Corporate Way, Dayton, OH 45459; (513) 433-2238; $495 retail. (For additional product details, circle 554 on one of the Free Information Cards.)*

GEODISK is a CD-ROM data base that contains graphical information on Georgia's highways, roads and trails, rivers, streams and creeks, lakes and ponds, reservoirs, pipelines and power transmission lines, county boundaries and census tracks, place and landmark names, and other topographic details. The program is designed for use in land planning/management, utility management, water resource control, and forestry and hazardous waste management occupations. The memory requirement is 640k. *Geovision, Inc., Suite One, 270 Technology Park, Atlanta, GA 30092; (404) 448-8224; $1,995 retail. (For additional product details, circle 459 on one of the Free Information Cards.)*

HARMONY version 2 adds five new accounting modules (Accounts Payable, Accounts Receivable, Payroll, Spreadsheet, and Information Manager) that enable users to extract data from accounting files and create reports. The latest release brings to eight the number of modules presently available. The company plans to release four more modules (Inventory, Order Entry, Purchasing, Client Accounting) at a later date. All current modules have a common user interface, function-key commands, interactive on-screen tutorials, and context-senstive help. Pop-up windows are available for making selections. The memory requirement is 512k. *Open Systems, Inc., 6477 City West Parkway, Eden Prairie, MN 55344; (612) 829-0011; Accounts Payable ($599), Accounts Receivable ($599), Payroll ($599), Spreadsheet ($99), Information Manager ($299), retail or direct order. (For additional product details, circle 460 on one of the Free Information Cards.)*

IDENTITY is a menu-driven relational data base management system that uses screen prompts and English-like commands to facilitate data entry and retrieval. Pop-up menus provide names of tables and columns and users can link up to 15 tables on the basis of common columns. The program's fully relational capabilities enable

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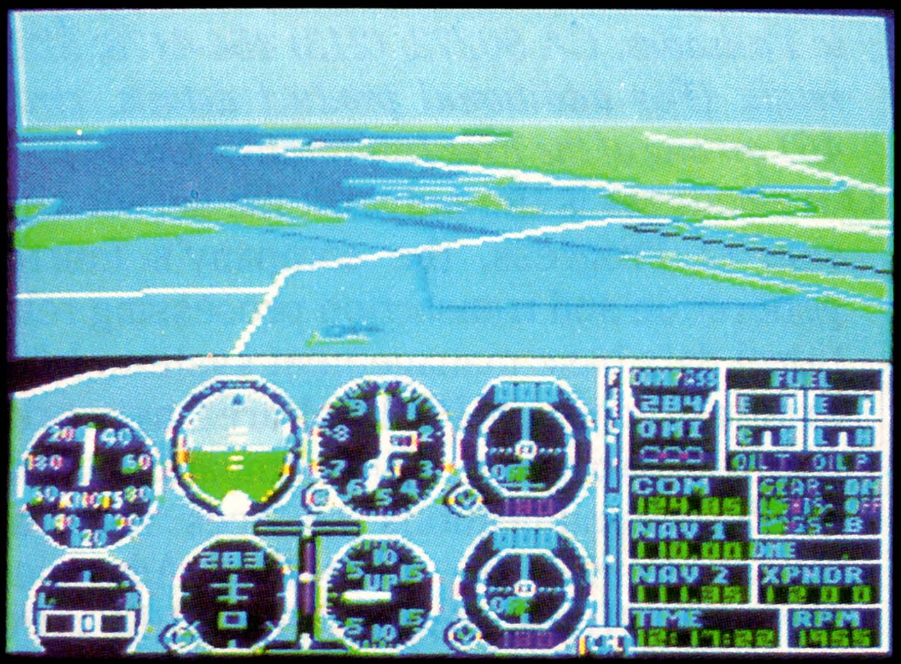
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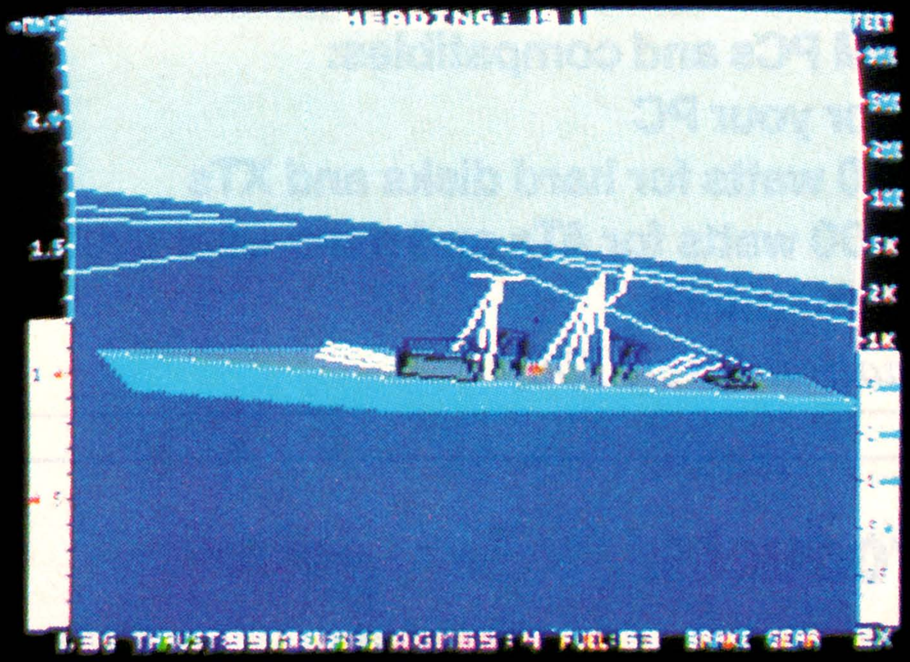
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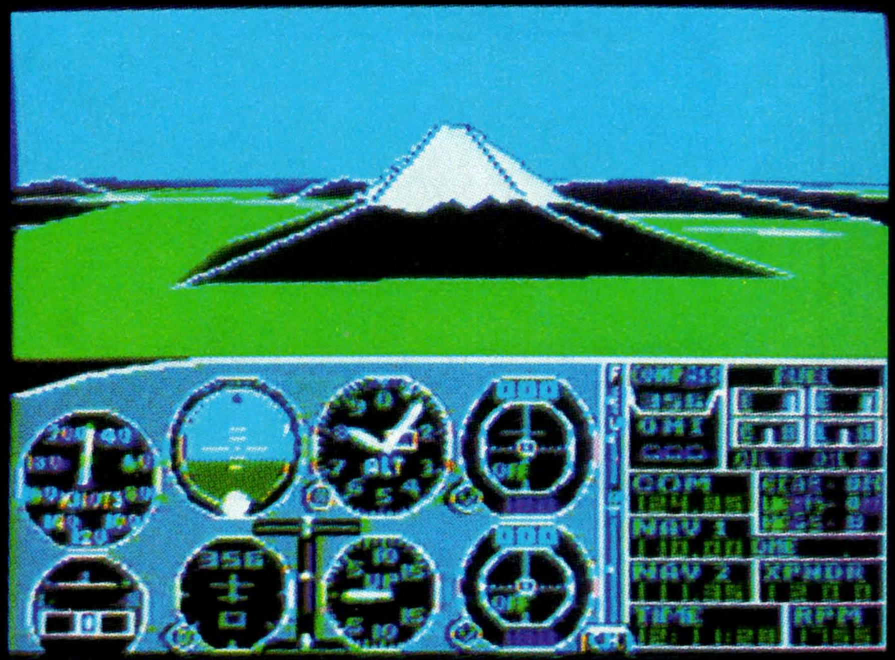
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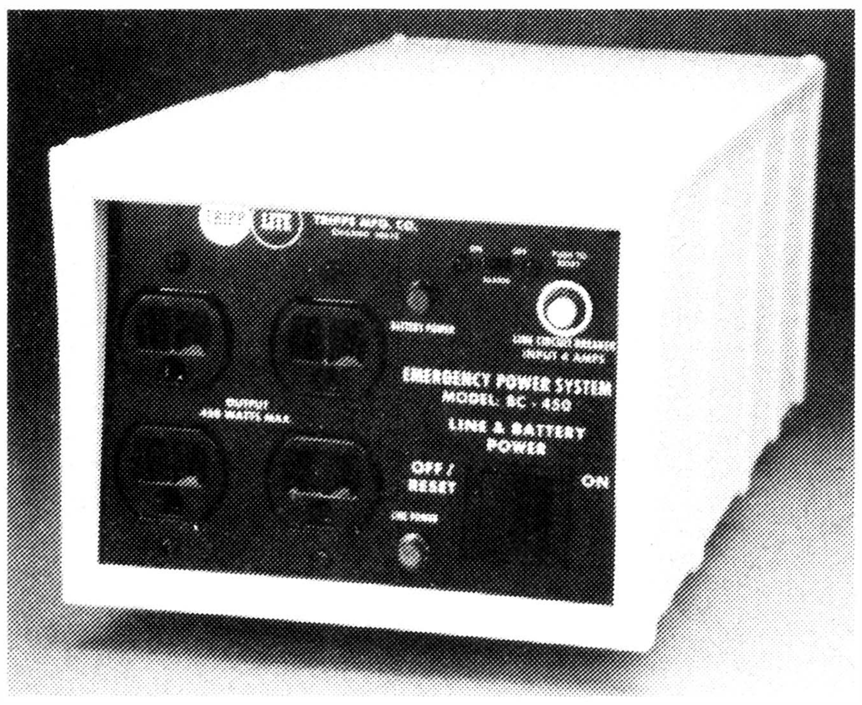

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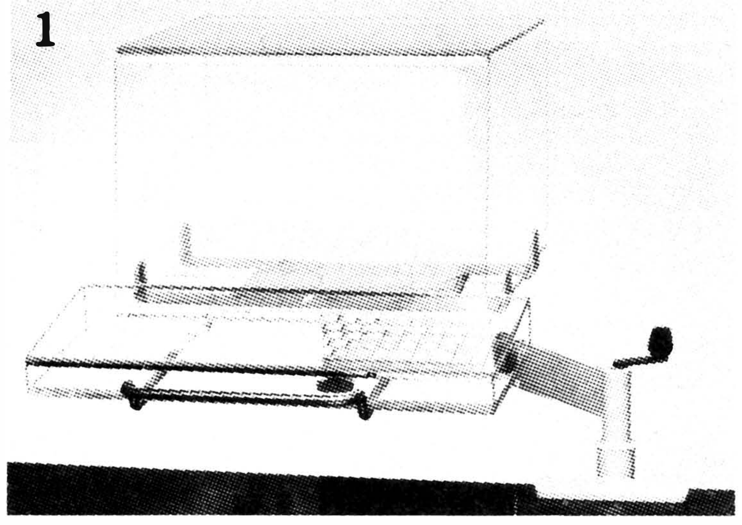

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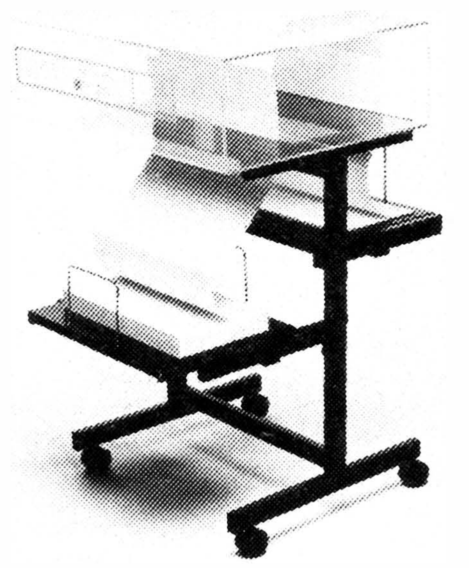

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users to perform relational operations on up to 15 tables, simultaneously, by using the program's Retrieve command. In addition, Identity supports four types of storage structures (HEAP, HEAPSHOT, HASH, and ISAM), features normally found in mainframe programs. The amount of data Identity can handle is limited only by disk space. The memory requirement is 640k. *Horizons Unlimited & Assoc., 1786 Michael Lane, Pacific Palisades, CA 90272; (213) 454-4178; $295 retail. (For additional product details, circle 461 on one of the Free Information Cards.)*

LAN PROGRESS is the network file server version of Progress, the company's fourth-generation and transaction processing relational data base management system. LAN Progress runs on PC local area networks (LANs) providing IBM-compatible NetBIOS communications services such as those found on Novell's Advanced Netware, IBM's Token Ring, IBM's PC Network, and Excelan's Exos LANs. According to the manufacturer, the program provides automatic "crash" detection and recovery to provide fault tolerant data processing on NetBIOS-compatible LANs (without users having to intervene) by detecting hardware or software failure on the network's file server. The program also contains automatic multiuser record locking. The minimum memory requirement is 512k; 640k is recommended. *Data Language Corp., 47 Manning Road, Billerica, MA 01821; (617) 663-5000; $2,450 (per server), retail or direct order. (For additional product details, circle 462 on one of the Free Information Cards.)*

LIBRARIAN LIST, a data base system intended for use in libraries, is comprised of nine data bases designed to aid in overall library management. The Book/Loan Catalog lists books by author, title, publisher, description, subject, loan date, and borrower; Journal Catalog includes features for cost analysis, subscription lengths, and wear indexes. The other data base files include Staff Schedules, Text Editor, Mail Lists, and File Transfer. The program runs on IBM Personal Computers and the Apple II series; the memory requirement is 256k. *Andent, Inc., 1000 North Ave. Waukegan, IL 60085; (312) 223-5077; $150 retail. (For additional product details, circle 463 on one of the Free Information Cards.)*

MULTILINK ADVANCED is a multiuser and multitasking system that partitions RAM in PC-compatible computers to concurrently support up to 17 applications. Multilink Advanced has record- and file-locking features and can support multiuser and network versions of applications such as R:base System V, Smart, and dBase III Plus. Multilink Advanced works in conjunction with the AT Gizmo—a card that attaches to an 80286 motherboard and remaps memory. It enables applications to reside in up to 8Mb of extended memory. With Multilink Advanced and AT Gizmo, 600k applications can simultaneously access extended memory. The memory requirement is 128k. *The Software Link, Inc., 8601 Dunwoody Place, NE, Suite 632, Atlanta, GA 30338; (404) 998-*

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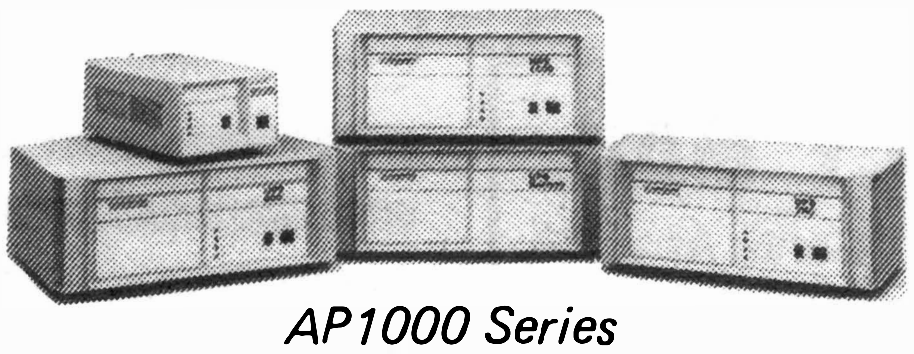

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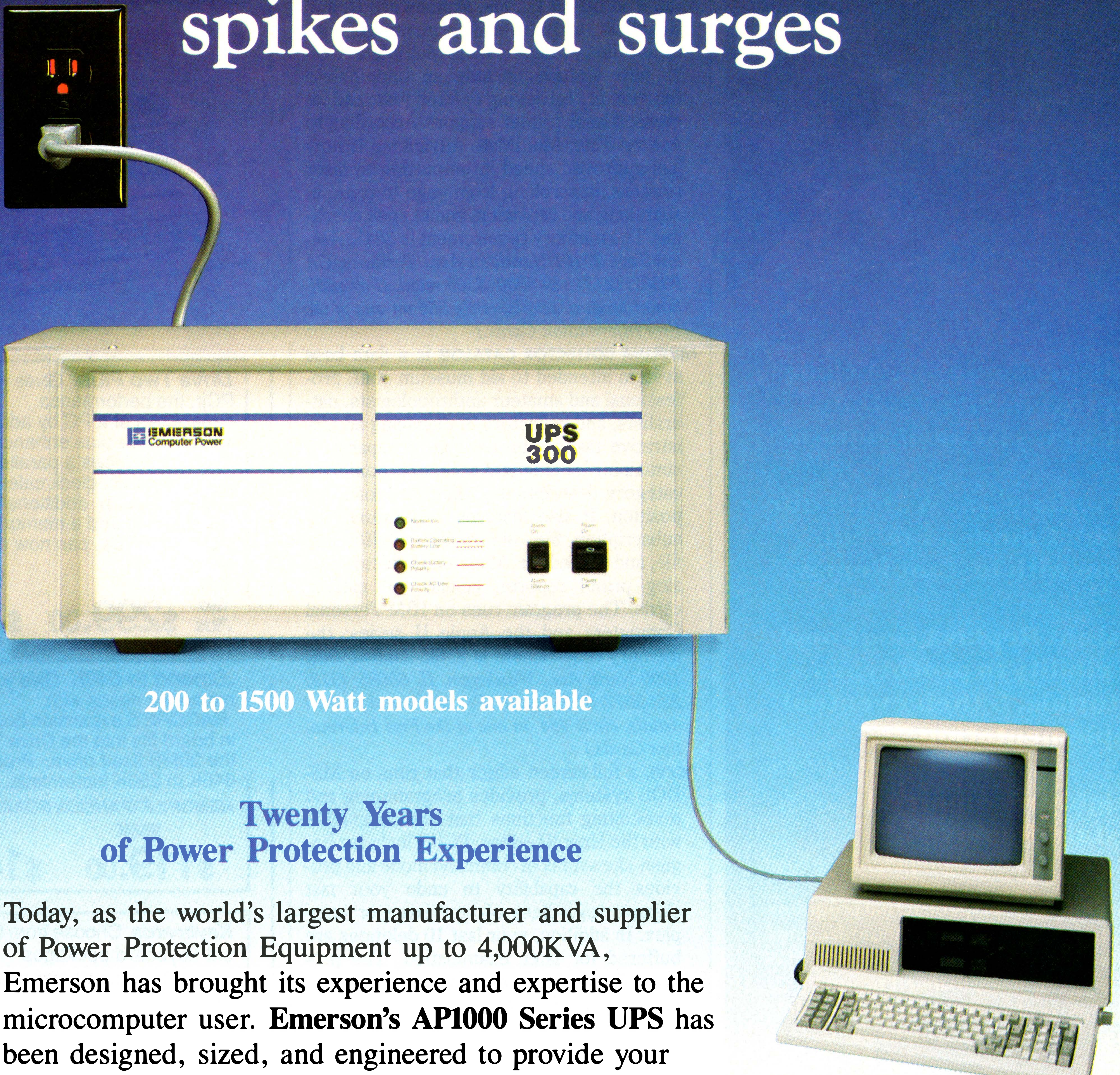

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PRODUCT LISTINGS

0700; $595 (multiuser version), $195 (single-user version), $295 (AT Gizmo), retail. (For additional product details, circle 555 on one of the Free Information Cards.)

MULTIMATE ADVANTAGE II is the new version of the MultiMate Advantage word processing program with new features that include optional document or page orientation; optional pull-down menus consistent with those in dBase II Plus, Framework II, and RapidFile; and the ability to merge with dBase files without leaving MultiMate. Other new features include an undo/delete function for retrieving deleted text, and increased laser printer support. According to Ashton-Tate, MultiMate Advantage II now has improved speed in outputting to laser printers, in scrolling from page to page, in searching and replacing, and in spell checking. The memory requirement is 384k. *Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502; (213) 329-8000; $565 retail. (For additional product details, circle 556 on one of the Free Information Cards.)*

MUSEUM COLLECTOR CATALOG is a data base system intended to aid museum staff, professional and amateur anthropologists, naturalists, and collectors in managing administrative tasks. The package is capable of containing catalog and accession numbers, category descriptions, value, and loan disposition. It also features a literature file, subscription file, library file, staff/phone file, and text editor. Museum Collector Catalog prints reports, labels, and catalog cards. The program runs on IBM Personal Computers and the Apple II series; the memory requirement is 256k. *Andent, Inc., 1000 North Ave., Waukegan, IL 60085; (312) 223-5077; $150, retail. (For additional product details, circle 464 on one of the Free Information Cards.)*

PC/VI, a full-screen editor that runs on MS-DOS systems, provides programming and text-editing functions that are compatible with the Unix VI editor. PC/VI includes English-like syntax in command mode and provides the capability to undo your last change, regardless of how large or complex. In addition, your last 10 deletions are buffered for later examination. The program also enables a user to perform searches using regular expressions, and has full macro capability. Finally, other programs can be run from within PC/VI. The memory requirement is 256k; 512k, hard disk, and Fansi-Console are recommended. *Custom Software Systems, PO Box 678, Natick, MA 01760; (617) 653-2555; $149 retail. (For additional product details, circle 465 on one of the Free Information Cards.)*

READY-TO-RUN ACCOUNTING WITH LOTUS 1-2-3 is an accounting package add-on for Lotus 1-2-3 that is designed for use by retailers, manufacturers, and distributors. The company recently added the Inventory/Order-entry module to the $199.95 program that already includes General Ledger, Accounts Payable, Accounts Receivable, and Payroll modules. Separate versions of Inventory/Order-entry are available for 1-2-3 release 1A and 2. The new module is an integrated inventory control, purchase order, and or-

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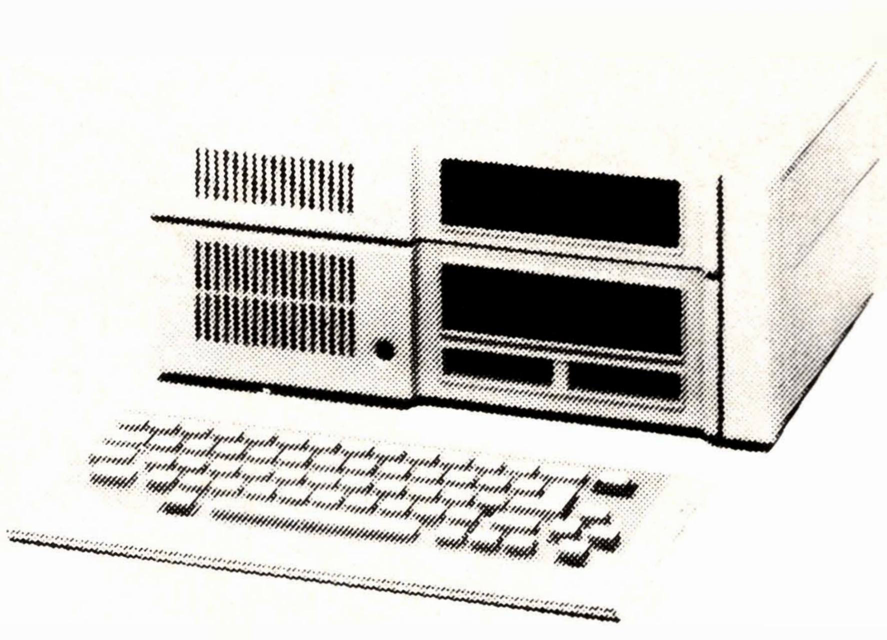

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(For More Information Circle 57)

der-entry system that enables users to create detailed invoices and keep track of up to 2,000 (6,000 with an extended memory board) inventory items. The module creates a data base of customers and is then capable of automatically generating a customer mailing list. The memory requirement is 320k. *Manusoft Corp., 8570 W. Washington Blvd., Culver City, CA 90232; (213) 559-1561; $69.95 (Inventory/Order-entry module), retail. (For additional product details, circle 466 on the Free Information Card.)*

TAS-BOOKS is an inexpensive accounting package, intended for the small-business market, that is comprised of General Ledger, Accounts Receivable/Invoicing, Accounts Payable/Purchase Order, Inventory Control, and Payroll written in the TAS-Plus (a relational data base) fourth-generation language. The program operates via pull-down menus and has the ability to import and export ASCII data files from other programs. The program is available in both single and multiuser versions. Customers are entitled to 30 days of free technical support, a six-month support plan is available for $75. The minimum memory requirement is 256k, plus a single floppy drive or hard disk; 384k is required if the program needs to be customized. *Business Tools, Inc., Cascade Business Park, 1125-12th Ave. NW, Suite B2, Issaquah, WA 98027; $99 retail. (For additional product details, circle 467 on one of the Free Information Cards.)*

WPEXECUTIVE is a combination word processor and spreadsheet made especially for laptop computers. The program is a condensed version of WordPerfect and MathPlan that provides additional word processing features, including an appointment calendar, a notebook, and spell checker; the spreadsheet includes a calculator. Spreadsheet files can be converted to Lotus 1-2-3 format, and all WPExecutive files are compatible with WordPerfect and MathPlan. The program is shipped with both 3.5- and 5.25-inch disks. The memory requirement is 256k. *WordPerfect Corp., 288 West Center St., Orem, UT 84057; (801) 226-7877; $249 retail. (For additional product details, circle 557 on one of the Free Information Cards.)*

PERFORMANCE

101 MACROS FOR SUPERCALC 4, the most recent release in the company line of add-on software utilities, makes available for Supercalc 4 most of the macros included in 101 Macros For Lotus 1-2-3. These include the ability to: double space a spreadsheet prior to printing; automatically address form letters and print labels; create graphic slide shows; perform calculations; maintain a calendar, and take notes using pop-up modules. The memory requirement is 256k. *Macropac International, 19855 Stevens Creek Blvd., Suite 168, Cupertino, CA 95014; (800) 624-0077 or (800) 832-7766 in Calif.; $69.95 retail. (For additional product details, circle 410 on one of the Free Information Cards.)*

ACTIONTRACKER is a project management system intended for use by middle managers who want to analyze projects and track the tasks of subordinates. The program is available in three versions: ActionTracker for 1.) personal project management 2.) the business user, with budgeting and resource allocations, and 3.) networks, with file- and record-locking capabilities and no restriction on the number of users. Both ActionTrackers for personal and business management require 320k of memory. The network version requires 512k. *Information Research Corp., 2421 Ivy Road, PO Box 7644, Charlottesville, VA 22906; (800) 368-3542, in Virginia call (804) 979-8191. ActionTracker ($98), ActionTracker with budgeting ($198), ActionTracker network version ($1,995), retail. (For additional product details, circle 411 on one of the Free Information Cards.)*

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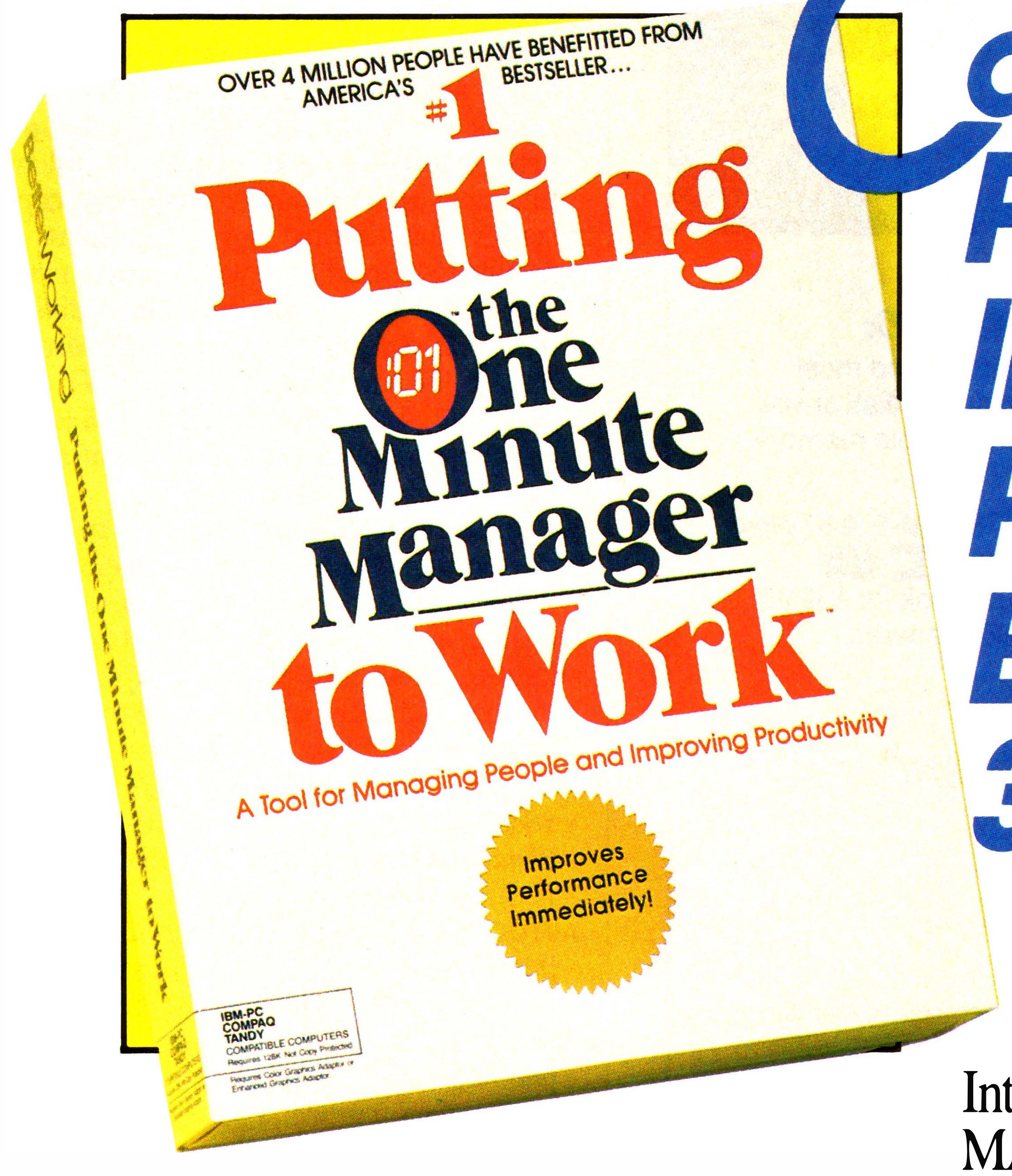
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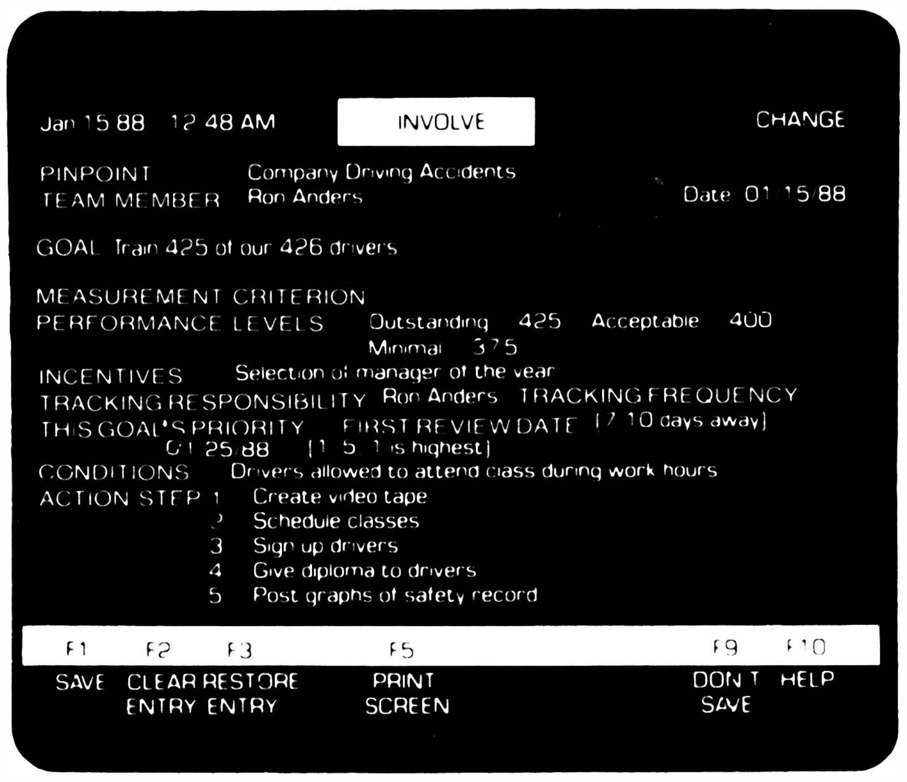

```
Jan 15 88   12 48 AM          INVOLVE                          CHANGE

PINPOINT         Company Driving Accidents
TEAM MEMBER      Ron Anders                          Date 01 15 88

GOAL  Train 425 of our 426 drivers

MEASUREMENT CRITERION
PERFORMANCE LEVELS      Outstanding   425   Acceptable   400
                        Minimal   375
INCENTIVES         Selection of manager of the year
TRACKING RESPONSIBILITY  Ron Anders   TRACKING FREQUENCY
THIS GOAL'S PRIORITY     FIRST REVIEW DATE  (7 10 days away)
            01 25 88     (1 5  1 is highest)
CONDITIONS        Drivers allowed to attend class during work hours
ACTION STEP  1    Create video tape
             2    Schedule classes
             3    Sign up drivers
             4    Give diploma to drivers
             5    Post graphs of safety record

 F1     F2      F3          F5                          F9     F10
SAVE  CLEAR RESTORE       PRINT                        DON'T  HELP
      ENTRY ENTRY         SCREEN                       SAVE
```

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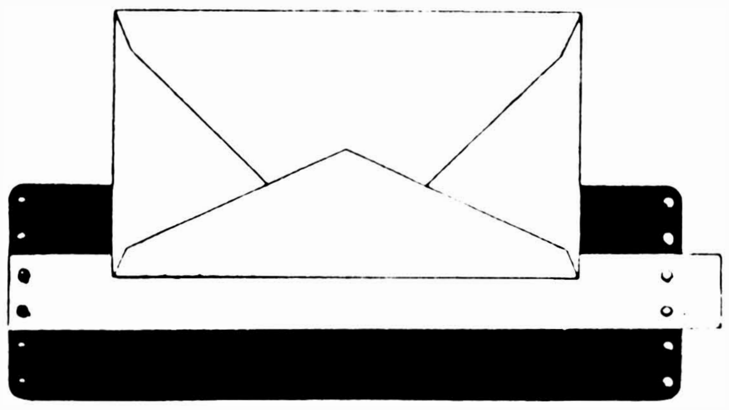

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(For More Information Circle 187)

PRODUCT LISTINGS

gram based on the Lowry method of managing and investing in real estate. It includes checklists to evaluate and rate property features; worksheets that calculate financing options, equity, cash-flow, capitalization and return on investment, and graphs to help analyze and compare properties. The memory requirement is 256k. *Simon and Schuster Computer Software, One Gulf & Western Plaza, New York, NY 10023; (212) 373-8882; $99.95 retail. (For additional product details, circle 412 on one of the Free Information Cards.)*

AMERICAN INVESTOR is designed to help users develop skills in portfolio management, fundamental research, technical analysis, and trading strategies. It uses historical markets to show how to buy and sell stocks, options and index options. The memory requirement is 512k. *Britannica Software, 185 Berry St., San Francisco, CA 94107; (415) 546-1866; $149.95 retail or direct order. (For additional product details, circle 525 on one of the Free Information Cards.)*

AUTOCAD 2.6 is an updated version of a computer-aided design (CAD) and drafting package. Enhanced are the three-dimensional (3D) design feature, transparent, pan, view and zoom commands, and the dimensioning feature. The program includes driver support for Hewlett-Packard's DraftMaster E-size and DraftPro D-size plotters, and Vermont Microsystems 1024 Image Manager display. *Autodesk, Inc., 2320 Marinship Way, Sausalito, CA 94965; (415) 331-8093; $2,850 (distributed through authorized dealers) retail. (For additional product details, circle 413 on one of the Free Information Cards.)*

AUTOMENU 4.0 is an updated shareware menuing system that enables users to move among programs and files without the necessity to access DOS. Some of the features include a menu-building facility and the ability to automatically execute application program commands at times the user designates. The memory requirement is 20k. *Magee Enterprises, 6577 Peachtree Industrial Blvd., Norcross, GA 30092; (404) 446-6611; $50 ($10 for a shareware evaluation copy, applicable to the full purchase price), retail. (For additional product details, circle 414 on one of the Free Information Cards.)*

BACKPAK 2.0 , the updated utility program for backing up and restoring data on hard disks, has been reconfigured to work in a menu-driven format and include a context-sensitive help screen. Backpak copies files to floppy disks in DOS format without encrypting files, as do other similar utility programs. After the initial backup procedure, the program copies only those files that are new or have been modified since the first backup, saving time. In addition, the program tells the user how many disks will be needed for the backup, automatically for-

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Game	Winner	Time to Move
1	SARGON III	5 seconds
2	SARGON III	5 seconds
3	SARGON III	15 seconds
4	SARGON III	15 seconds
5	SARGON III	30 seconds
6	Chessmaster	30 seconds
7	SARGON III	3 min
8	SARGON III	3 min

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(For More Information Circle 211)

PRODUCT LISTINGS

mats the disks, and verifies the copy procedure. The program supports both 5.25-inch drives (360k and 1.2Mb) and 3.5-inch drives (720k and 1.44Mb); the memory requirement is 256k. *California Software Products, Inc., 525 North Cabrillo Park Drive, Suite 300, Santa Ana, CA 92701; (714) 973-0440; $79 retail. (For additional product details, circle 415 on one of the Free Information Cards.)*

BROOKLYN BRIDGE, the program that transfers files between desktop and laptop computers, now has the ability to transfer files between desktops and the IBM Personal System/2. The package is comprised of a 5.25-inch disk (for use on a desktop PC), a 3.5 inch disk (for laptops and the Personal System/2), and a null modem serial cable to connect one system to the other. The program will then copy software from 5.25-inch disks onto the smaller 3.5-inch disks. *White Crane Systems, 6889 Peachtree Industrial Blvd., Suite 151, Norcross, GA 30092; (404) 454-7911; $129.95 retail. (For additional product details, circle 416 on one of the Free Information Cards.)*

CELL/MATE 2.0, a program that produces automatic English documentation of Lotus 1-2-3 and Symphony worksheets, now also supports the Intel Above Board and AST Rampage expanded memory boards. In addition, the updated package supports the latest version of 1-2-3 and Symphony, provides more than 30 error-checking reports, and has the ability to retrieve password protected files. The memory requirement is 256k. *Clarity Software Corp., 13276 Research Blvd., Austin, TX 78750; (512) 331-0465 or (800) 822-7890; $89 retail. (For additional product details, circle 417 on one of the Free Information Cards.)*

COMPUMATH is a mathematics program with graphics that offers menu selections for an introduction to general mathematics, complex arithmetic, matrix operations math, engineering mathematics, and basic statistical mathematics. The program supports two-dimensional statistical graphs and vector graphs. The memory requirement is 256k. *Esosoft Software, 444 Colton Road, Columbus, OH 43207; (614) 491-0832; $59.95 retail. (For additional product details, circle 526 on one of the Free Information Cards.)*

DEPRECIATION-MASTER II 5.0 is an updated program that enables accountants, banks, and other businesses to perform fixed-asset accounting on PCs. The menu-driven program can handle up to three depreciation methods per asset. The program supports all standard depreciation methods and Internal Revenue Service schedules in accordance with the Tax Reform Act of 1986. The memory requirement is 128k. *Generic Computer Products, Inc., PO Box 790, Marquette, MI 49855; (906) 249-9801; $349 retail. (For additional product details, circle 418 on one of the Free Information Cards.)*

DISKTOP 2.0 is a collection of three programs—two desktop accessories and a utility program—that provides users with quick DOS functions and the ability to check on printer status. The first desk accessory, DiskTop, enables a user to find, list, delete, rename, copy, move, or set at-

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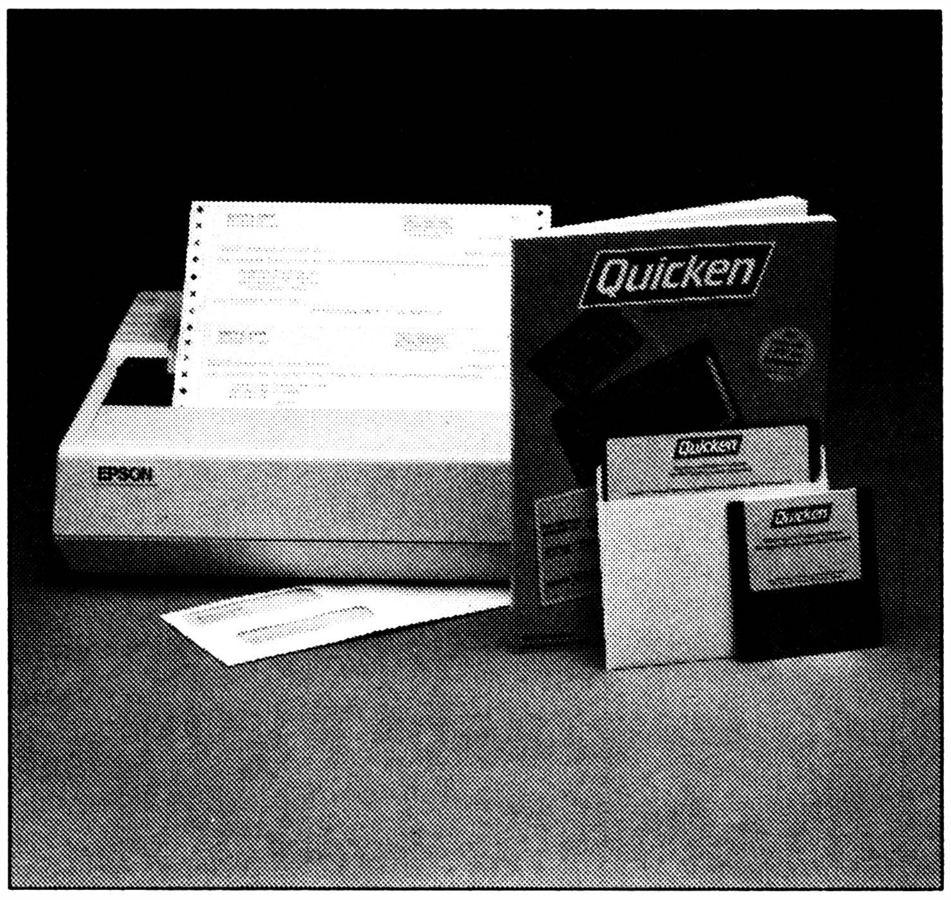

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tributes of files on any disk without leaving the current application. The second desk accessory, LaserStatus, enables a user to reset and download fonts and PostScript files to his LaserWriter. With the utility program, Widgets, users can create their own Disktop menus and start-up screens, select special paper sizes for the Imagewriter, convert PICT files to paint files, and send PostScript programs to the LaserWriter. The memory requirement is 128k. *CE Software, 801 73rd. St. Des Moines, IA 50312; (515) 224-1995 or (800) 523-7638 (to place an order), direct order. (For additional product details, circle 528 on one of the Free Information Cards.)*

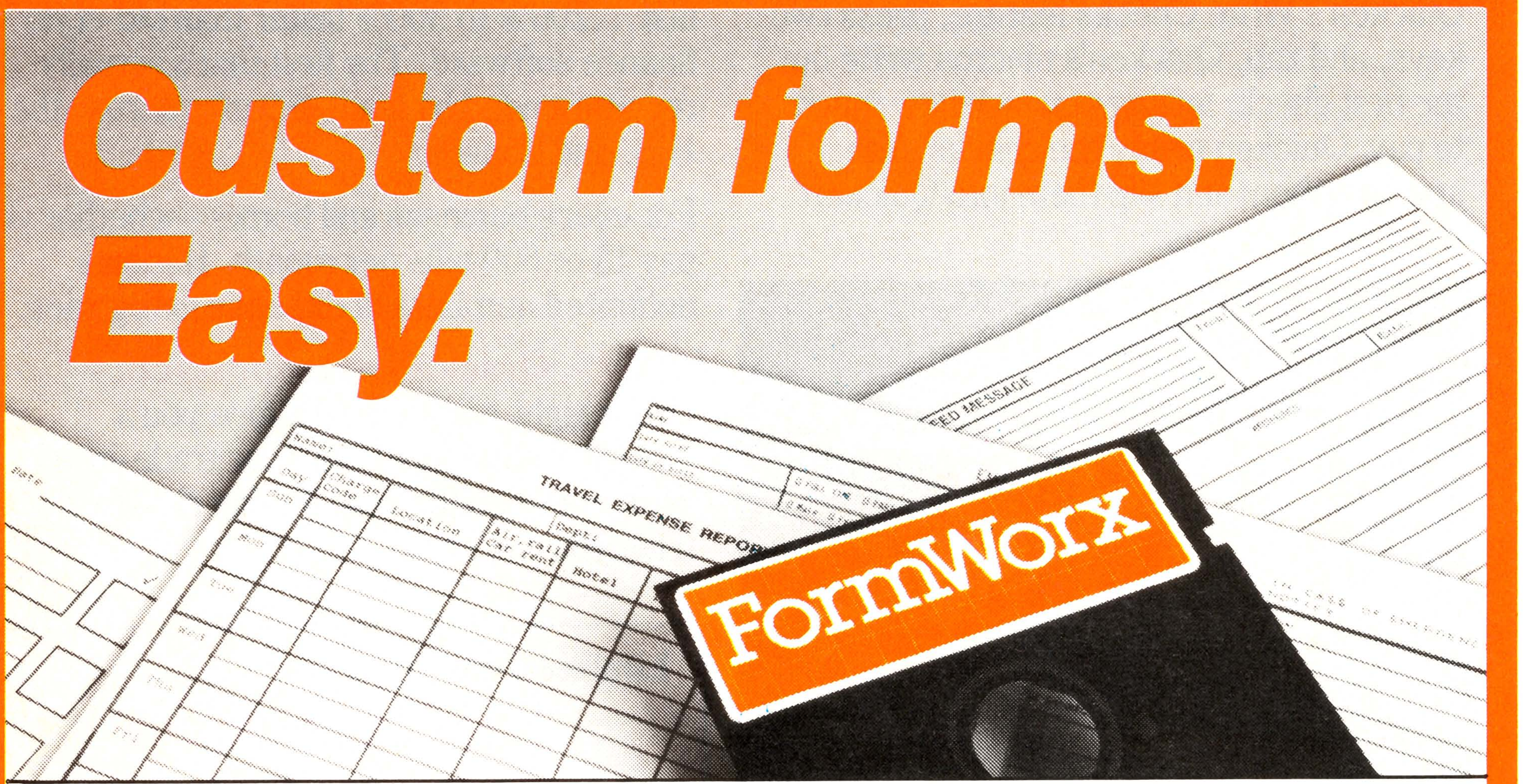
EXACT is a RAM-resident utility that enables users to edit complex mathematical formulas from within a word processing program. The program, an upgrade of the company's Superscript 2.0, also includes an EGA driver for use with both color and monochrome monitors. The program is capable of saving formulas within their documents or separately to be called up in a different document. The program includes 20 fonts that contain more than 1,500 characters and symbols. All dot matrix printers are supported; support for laser printers includes the Hewlett-Packard LaserJet and the LaserJet Plus. According to the manufacturer, Exact will work with any word processor. The memory requirement is 128k. *Technical Support Software, Inc., 72 Kent St., Brookline, MA 02146; (617) 734-4130; $475 retail. (For additional product details, circle 419 on one of the Free Information Cards.)*

EXPRESSIONIST, an equation editor for the Macintosh, is designed for easy editing of equations. Users can edit equations by pointing and clicking with the mouse button, which brings a "scratchpad" onto the screen from where changes can be entered using the normal Macintosh editing conventions. The memory requirement is 512k. *Allan Bonadio Assoc., 1579 Dolores St., San Francisco, CA 94119; (415) 282-5864; $54.95 retail. (For additional product details, circle 420 on one of the Free Information Cards.)*

FRONT OFFICE is a sales and management program designed to help the small-business salesperson to market a product or service, keep track of sales performance, control job costs and payment, and increase sales activity. Front Office is a shareware product. The memory requirement is 512k. *Interactive Micro Inc., PO Box 478, Bradford, NH 03221; (603) 938-2127; $99 (registration fee), direct order. (For additional product details, circle 529 on one of the Free Information Cards.)*

GAMMAFAX PLUS, an updated version of the communications program, now includes board-level circuitry for Hayes modem compatibility and a font character recognition software option for converting a bit-mapped document from a fax machine into ASCII files. The new version, which runs on the IBM Personal Computer, PC XT, and PC AT, supports any 300- or 1200-bits-per-second communications software application. The program includes personal computer-to-personal computer file transfer and access to electronic mail services. The memory requirement is 256k; a system with two floppy disk drives is also required. *GammaLink, 2452 Embarcadero Way, Palo Alto, CA 94303; (415) 856-7421; $1,195 retail. (For additional product details, circle 421 on one of the Free Information Cards.)*

GRAPHICS & SYMBOLS 1, the first program in the DeskTop Art/PC graphics software series for the IBM PC, PC XT, and PC AT; includes more than 200 pictograms, seasonal symbols, and design symbols stored in PC Paintbrush format. The program includes graphics that have been selected and digitized from the company's library of 20,000 illustrations, which can be exported to desktop publishing or word processing programs. The memory requirement is 384k. *Dynamic Graphics, 6000 N. Forest Park Drive, Peoria, IL 61614; (309) 688-8800; $75*



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Not copy protected. Requires IBM PC with 256 KB and DOS 2.0 or higher. Works with or without graphics board. FormWorx is a trademark of FormWorx Corp.

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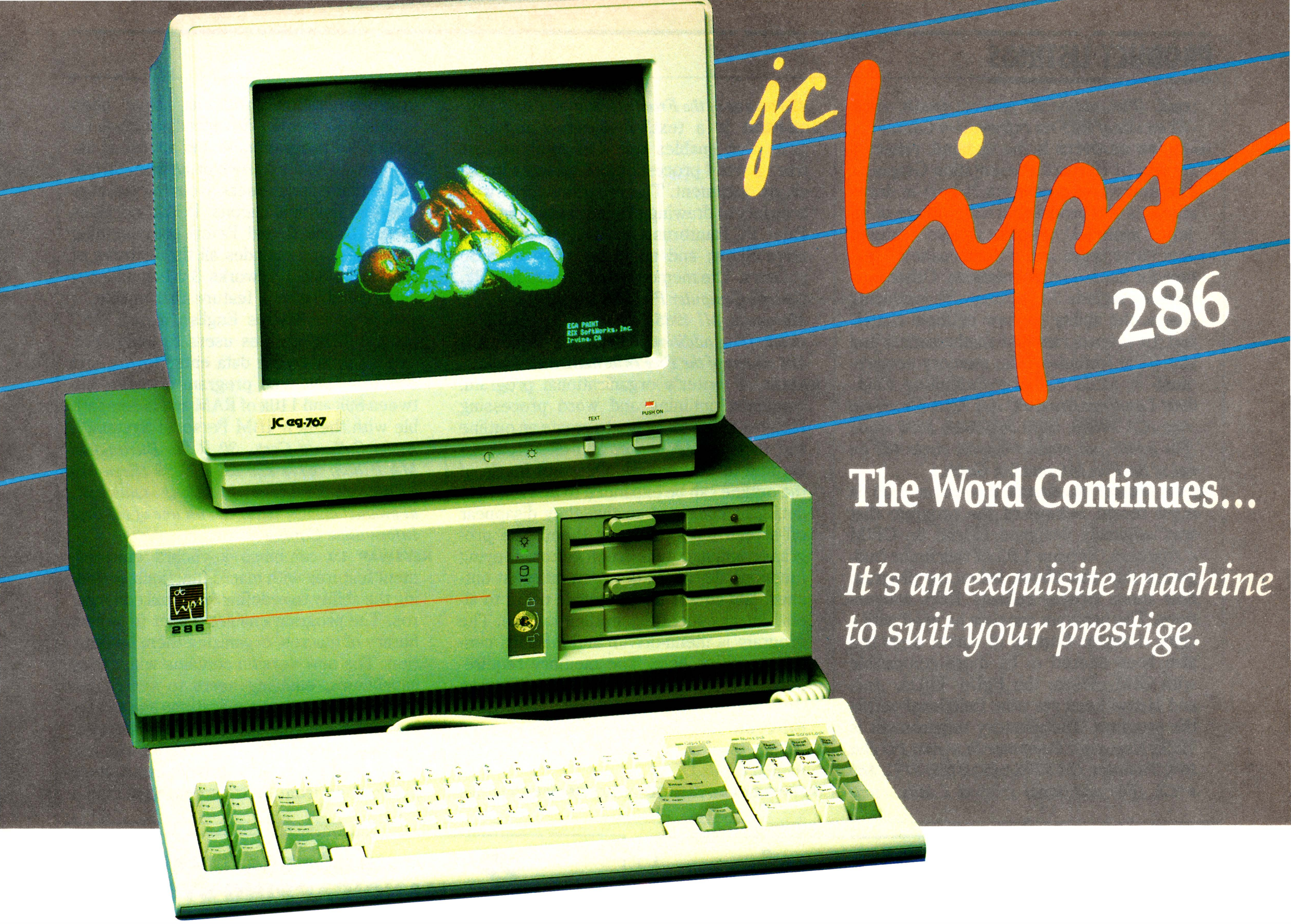

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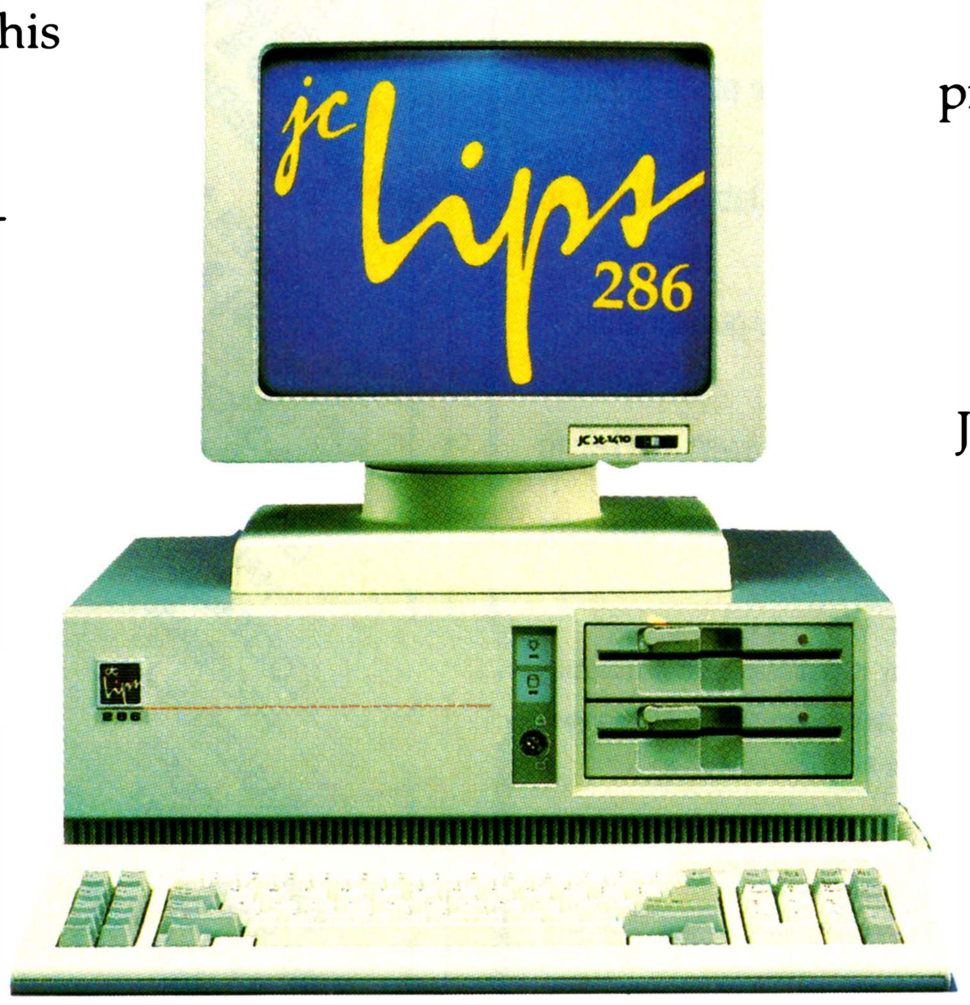

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retail. (For additional product details, circle 422 on one of the Free Information Cards.)

HARVARD GRAPHICS is the updated, renamed version of Harvard Presentation Graphics. The new version now offers built-in drawing tools and produces a wider range of in-depth analytical graphs. It also features new chart types and a "screenshow" feature for desktop presentations. Other new features include 3-D options for producing charts, the ability to view multiple charts, and 19 preprogrammed mathematical and statistical formulas. The memory requirement is 512k. *Software Publishing Corp., 1901 Landings Drive, PO Box 7210, Mountain View, CA 94039; (415) 962-8910; $695 retail. (For additional product details, circle 482 on one of the Free Information Cards.)*

HOME MONEY MANAGER II version 1.05 is most recent release of the program that was originally designed to run on CP/M computers. Version 1.05 of this home budgeting and checkbook balancing program now more closely reflects DOS conventions. The program can now be used with a color monitor. Control of cursor keys has also been altered to be more compatible with IBM clones; the PgUp, PgDn, End, and Home keys are now functional within the program. The memory requirement is 192k. *Homecraft Computer Products, PO Box 974, Tualatin, OR 97062; (503) 692-3732; $89 retail. (For additional product details, circle 423 on one of the Free Information Cards.)*

INTE-PRINT is a text/graphics-merging program that enables users to combine text from a word processor and pictures into a single document. The program works with a variety of drawing programs including PC Paint, PC Paintbrush, PC Crayon, and Executive Show; and supports more than 30 printers. The memory requirement is 128k. *Generic Computer Products, Inc., PO Box 790, Marquette, MI 49855; (906) 249-9801; $49.95 retail. (For additional product details, circle 424 on one of the Free Information Cards.)*

KAMAS, a writer's organizational program, combines outlining and word processing features to enable users to create an outline and then create, write, and alter text according to that outline. Different levels of the outline can be expanded to be viewed in detail, or collapsed so that they disappear off-screen until you need them. The program contains a full-screen editor, copying functions that work between different outlines, and commands to enable users to alphabetically sort titles in their outline. The program is menu-driven and includes context-sensitive help. The memory requirement is 256k. *Kamasoft, Inc., 2525 SW 224th Ave., PO Box 5549, Aloha, OR 97007; (503) 649-3765; $69.95 retail. (For additional product details, circle 425 on one of the Free Information Cards.)*

KEYWORKS ADVANCED and **KEYWORKS 3.0**, two macro-generation programs, have been updated. Keyworks Advanced, which is intended for programmers and advanced users, now includes its own programming language that enables users to customize, control, and link applications. It also provides access to the C and Pascal programming languages, and includes all the features of Keyworks 3.0. Keyworks 3.0 has added a "shorthand" macro feature that enables a user to give macros English names. The program also enables users to build DOS menu shells, create data entry forms, and edit text files. The program occupies between 89k and 110k of RAM and is compatible with the new IBM Personal System/2. *Alpha Software Corp., 30 B St., Burlington, MA 01803; (617) 229-2924; $299 (Keyworks Advanced), $99 (Keyworks 3.0). (For additional product details, circle 426 on one of the Free Information Cards.)*

KEYSWAP 4.0 combines keyboard enhancement features with macro functions, including the ability to redefine keys and edit macros. The program enables a user to keep a library of macros, organizing them by function. The new version contains windowing capabilities, enabling users to switch between two different applications and to execute DOS commands from within an application. Keyswap 4.0 also contains cut and paste capabilities so that users can capture information from their screen, save it in a

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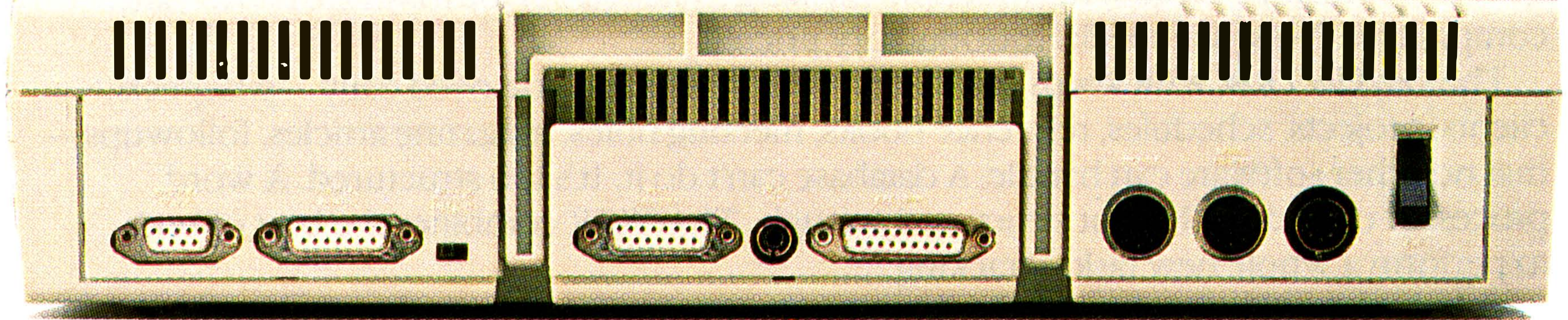

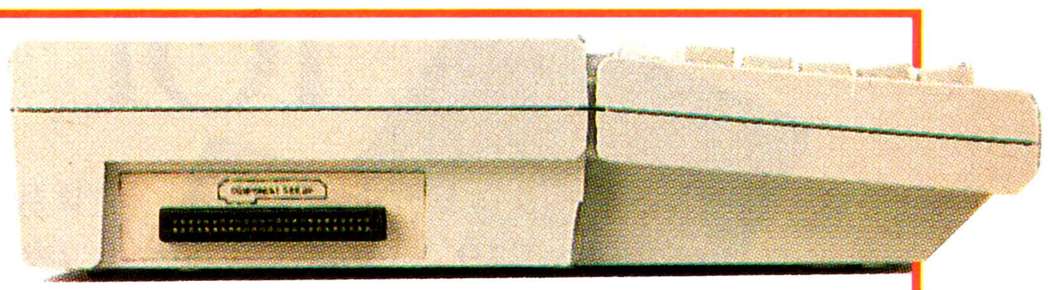

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(For More Information Circle 59)

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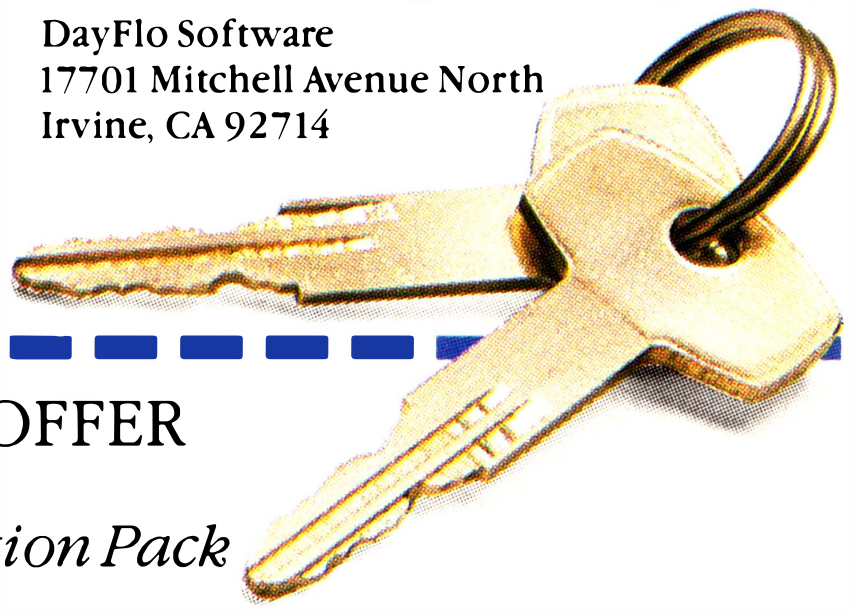

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(For More Information Circle 214)

PRODUCT LISTINGS

macro, and call it back from within another application. Keyboard macros can also be turned on and off with a hot key. The memory requirement is 42k. *Maverick Software, Inc., 533 Main St., Ste #10, PO Box 998, Melrose, MA 02176; (617) 662-0856; $99.95 retail. (For additional product details, circle 427 on one of the Free Information Cards.)*

LABEL MASTER 3.0 is an update to the product that now includes auto-dialing and instant record display. It offers unlimited sorting-selection options and state/zip code checking. It also contains an import/export feature for ASCII files. The memory requirement is 256k. *RKS Associates, 3820 N. Dittmar Road, Arlington, VA 22207; (703) 536-7814; $35 (shareware), direct order. (For additional product details, circle 530 on one of the Free Information Cards.)*

MACPUBLISHER III is a desktop publishing program for Apple Macintosh computers (512k Enhanced, Plus, SE, and II). According to the company, MacPublisher III is the first to provide for the precise placement, resizing, and rotation of PostScript items directly on the page and also supports Encapsulated PostScript. In addition, the program is capable of displaying gray text in 10 percent increments; rotating text and graphics using the program's Spec Sheets features; printing in color on an ImageWriter II; and displaying color on the Mac II. MacPublisher III also includes a telecommunications feature that enables users to send both text and picture files via modem to a laser printer. Finally, the program includes the 93,000-word Houghton Mifflin English Hyphenator dictionary. The memory requirement is 512k; an external disk drive is also required. *Boston Publishing Systems, 1260 Boylston St., Boston, MA 02215; (617) 267-4747; $295 retail. (For additional product details, circle 531 on one of the Free Information Cards.)*

ME2 is a menu-driven automatic backup utility for backing up data to two separate IBM PC AT or compatible hard drives. Me2 supports up to four 32Mb partitions per drive and a password system is available that supports up to nine levels of user-programmed access. Detailed records of log-on time can be used in conjunction with the password facility. The memory requirement is 640k. *Atlantic Microsystems, Inc., 8A Industrial Way, Salem, NH 03079; (603) 898-2221; $285 retail. (For additional product details, circle 428 on one of the Free Information Cards.)*

METASTOCK 2.0 helps users analyze stock, commodity, mutual fund, bond, and options investment with charting tools, overlays, and trendlines. Version 2.0 includes support for enhanced graphics adapters, and additional financial formulas. The memory requirement is 384k (640k recommended). An IBM color graphics adapter or an IBM enhanced graphics adapter is also required. *Computer Asset Management, PO Box 26743, Salt Lake City, UT 84126; (801) 974-5115 or (800) 882-3040 (to place an order); $195 retail. (For additional product details, circle 429 on one of the Free Information Cards.)*

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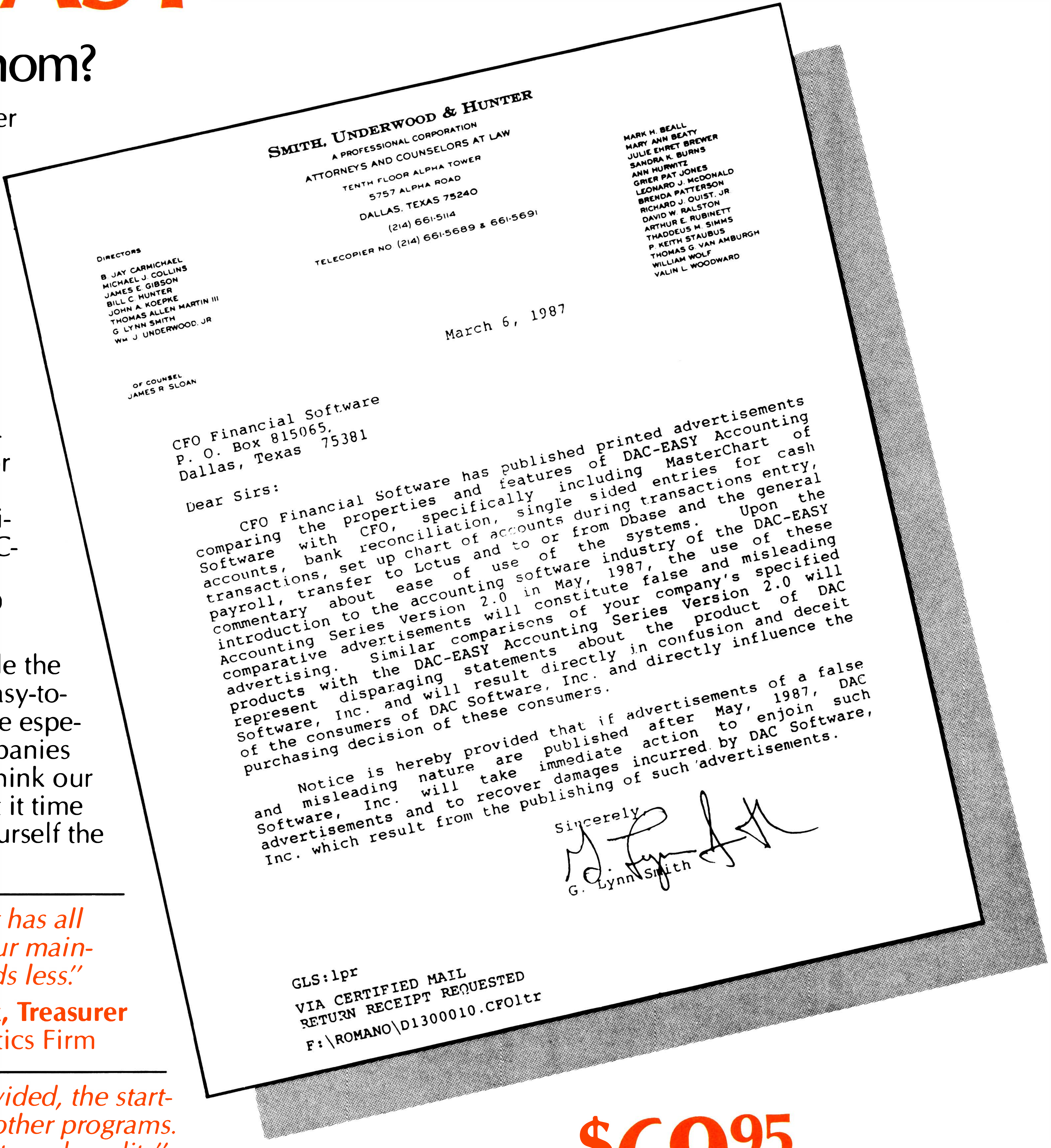

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(For More Information Circle 192)

PRODUCT LISTINGS

owners and managers that enables them to handle aspects of single or multi-suite management, from rent status to maintenance agreements. The memory requirement is 256k. *The Advantage Group, Inc., 260 Riverside Ave., Suite 208, Westport, CT 06880; (203) 454-2515; $3,500 retail. (For additional product details, circle 532 on one of the Free Information Cards.)*

MORE PERFECT is a collection of word processing macro utilities for WordPerfect. According to the manufacturer, using More Perfect with WordPerfect increases editing speed by adding two-key commands that delete lines to the left and right of the cursor and move all remaining text up one line. Two-key commands are also available to transpose letters and to send control codes to an Epson printer. The memory requirement is 256k. *F/22 Press, PO Box 141, Leonia, NJ 07605; (201) 568-6250; $19.95 retail. (For additional product details, circle 533 on one of the Free Information Cards.)*

SNOW REPORT WRITER enables users to create custom reports, mailing lists, labels, letters, and business graphics and can be used as a stand-alone program or with files from data bases and word processors such as dBase II and III, and Wordstar; and can be linked to spreadsheets (Lotus 1-2-3 and Multiplan) via DIF formats. The Snow Report Writer enables the user to create a single report from eight different file formats. The memory requirement is 384k. *Snow Software, 2360 Congress Ave., Clearwater, FL 33519; (813) 784-8899; $695 retail. (For additional product details, circle 549 on one of the Free Information Cards.)*

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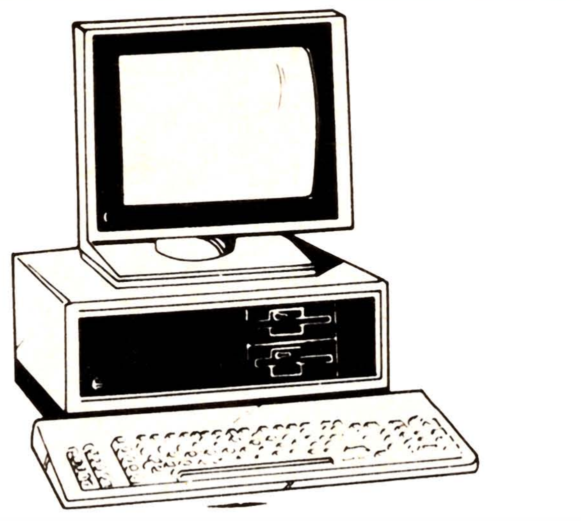

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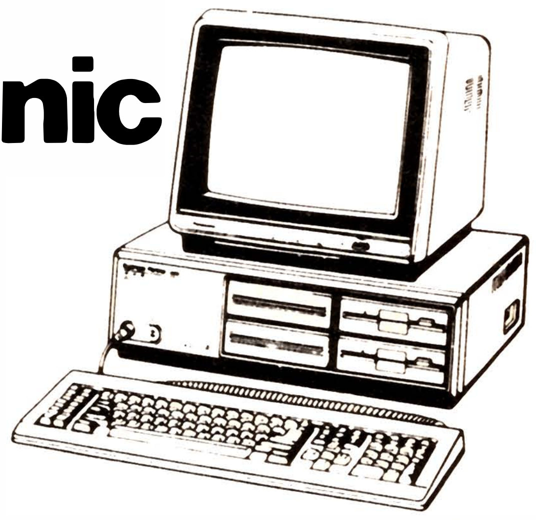

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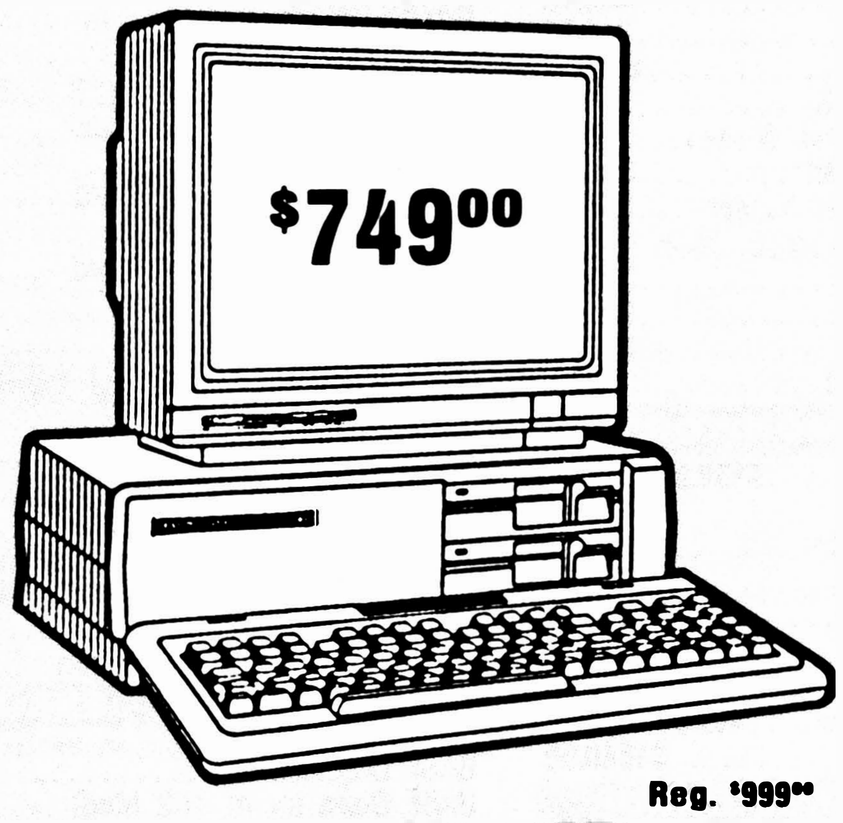

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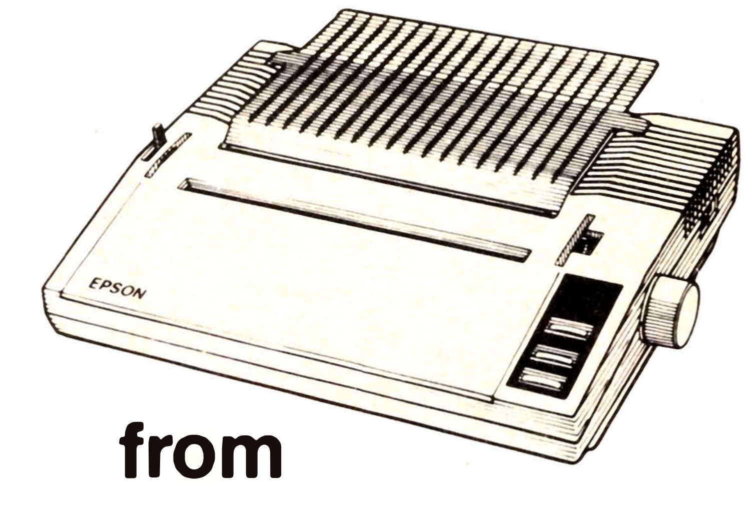

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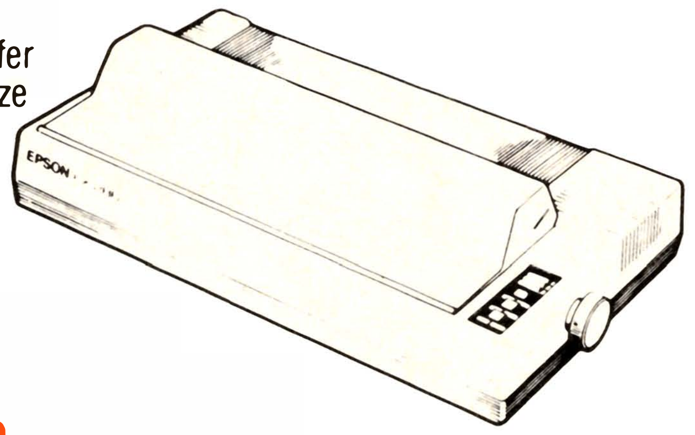

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- 8K buffer
- Front panel selectable
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Options

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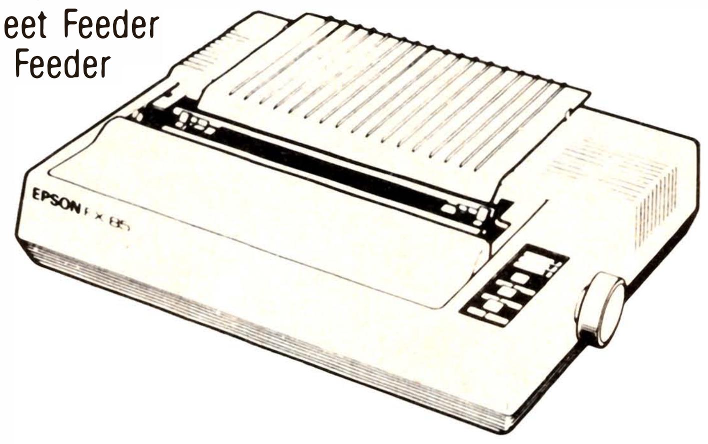
- Tractor Feeder



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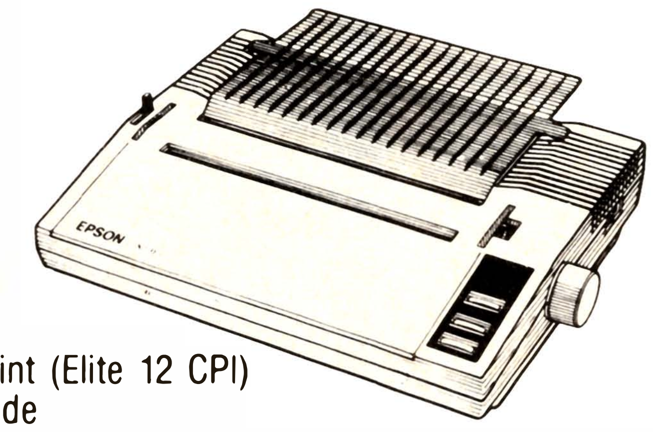

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Options

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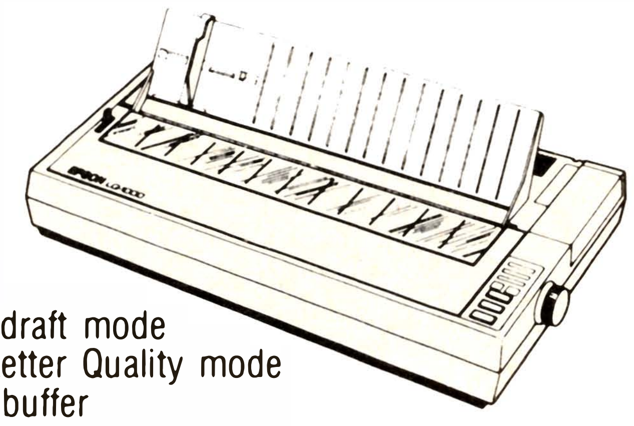
- 32K buffer

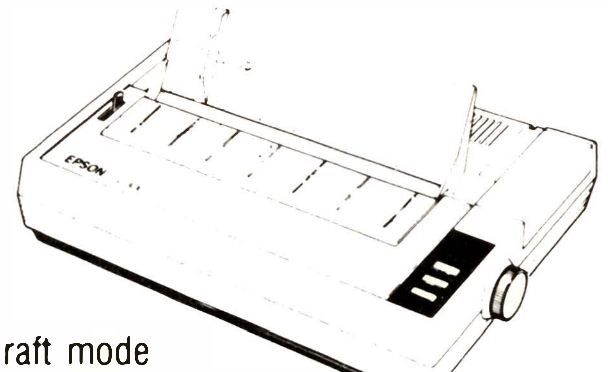


LQ-1000

- 180 cps in draft mode
- 60 cps in Letter Quality mode
- 7K internal buffer

Options

- Tractor Feed
- Cut Sheet Feeder



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Options

- Tractor Feed
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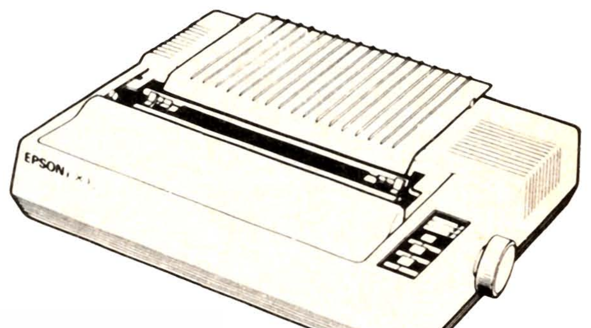

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- 54 cps (Elite 12 CPI) in Near Letter Quality mode
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Options

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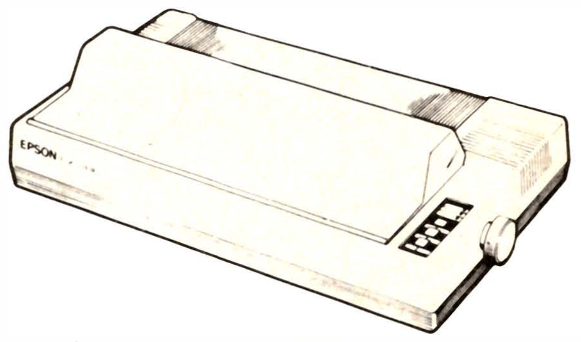
- Single and Double Bin Cut Sheet Feeders
- 32K buffer



EX-800

- 300 cps (Elite 12 CPI) in draft mode
- 54 cps (Elite 12 CPI) in Near Letter Quality mode
- 8K internal buffer

Options

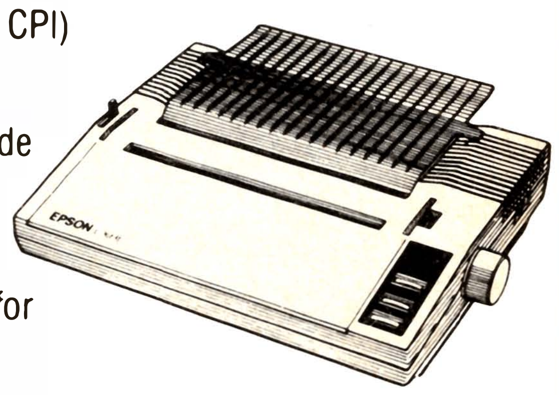
- Color enhancement
- 32K buffer

***LX-86**

- 120 cps (Pica 10 CPI) in draft mode
- 16 cps in Near Letter Quality mode

Options

- Cut Sheet Feeder
- Tractor Feed
- Interface boards for additional buffer



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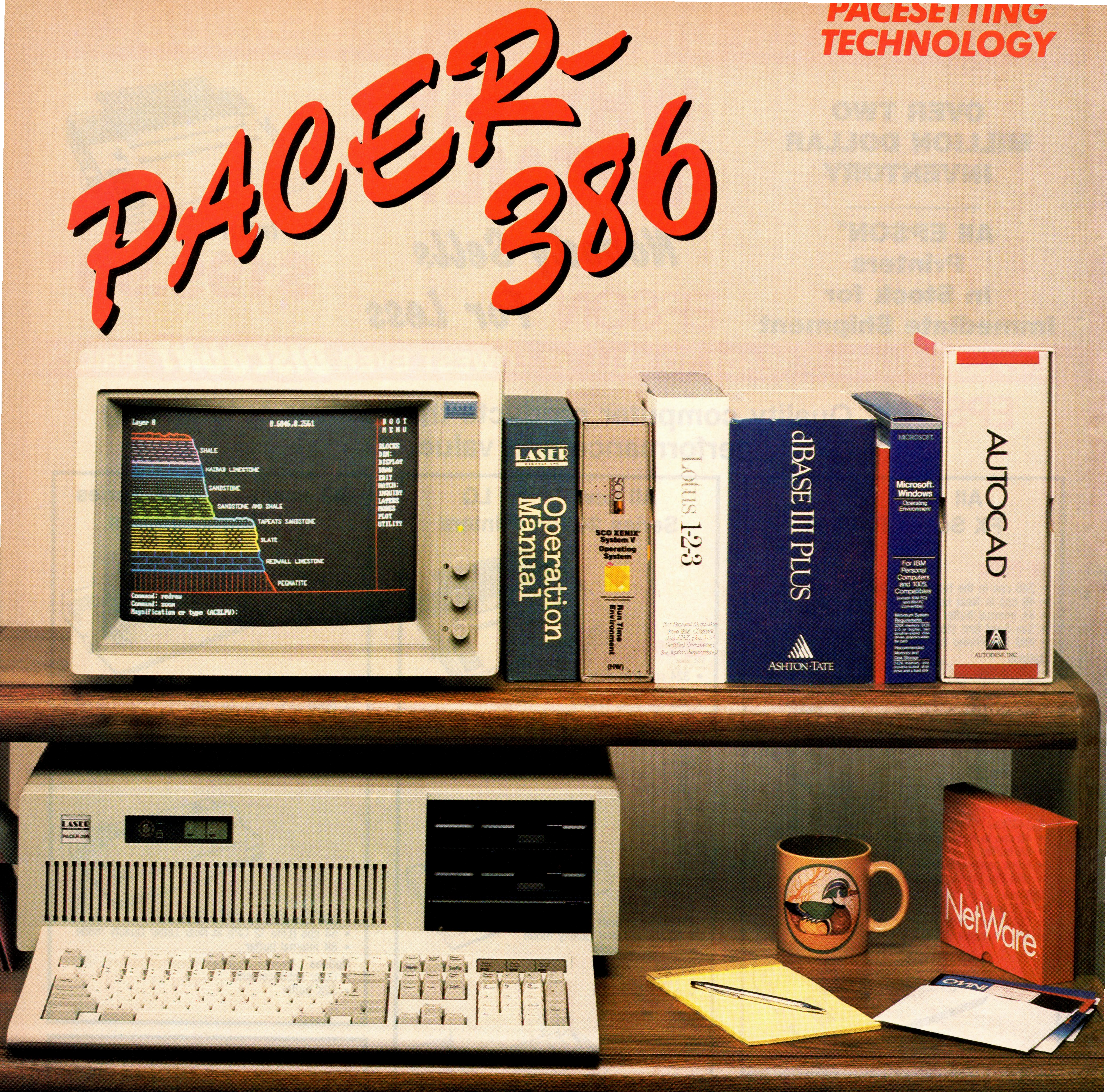
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ANSWERS/ This Month's Queries From Our Readers

Partners In Printing

Q: *I own a Panasonic Sr. Partner portable computer. It has a built-in thermal printer, and I have set up an external parallel printer. How can I direct all output to the external printer after I boot up?*
A: You can write a simple program in Basic and put that file in an AUTOEXEC.BAT file that will execute automatically when you boot up. This way, all your printer commands will automatically be redirected to the second printer. To do this:

First, load Basic by typing BASICA at the DOS prompt; then enter the following program:

```
10 DEF SEG=&H40
20 POKE &H8,120
30 POKE &H9,3
40 POKE &HA,255
50 POKE &HB,15
60 SYSTEM
```

There should be a menu on the bottom of your screen indicating that F4 is the key used to save a file. Hit F4, then type in whatever you want to call the file (PRINTER, for example). If you want to save it in a specific drive, type in the drive and : (a colon) before the file name (A:PRINTER).

Next, exit Basic and create an AUTOEXEC.BAT file. You can do this with either the EDLIN command or COPY CON, which copies what you key in from your console (keyboard). Here's how you would use COPY CON:

```
COPY CON AUTOEXEC.BAT
BASICA PRINTER
^Z
```

Happy printing!

SHORTCUTS

If At First . . .

The shortcut in your April 1987 issue ("Fail-Safe Batch File," page 215) is a good idea; however, several errors are included and a couple of improvements could be added to the batch file.

In lines 5 and 6 (IF %1==A:GOTO SKIP1<CR>; IF %1==B:GOTO SKIP 2<CR>, respectively), the GOTO statement tells the batch file to GOTO SKIP1 and GOTO SKIP2. (Note that there should not be a space between the SKIP and succeeding digit.) The GOTO locations, however, are shown with spaces on lines 16 and 20 (:SKIP 1<CR>; :SKIP 2 <CR>, respectively). Those locations will not be recognized by the preceding GOTO statements.

Adding two more IF statements with lowercase drive-letter assignments will be helpful:

```
IF %1==a: GOTO SKIP1<CR>
IF %1==b: GOTO SKIP2<CR>
```

Otherwise, you must key in the drive-letter assignments as capital letters. Most often, users don't shift to uppercase when giving commands and the Caps Lock key is not engaged.

The second-to-last line of the batch file (#23: GOTO END<CR>) is not needed since :END follows immediately.

Adding an ECHO OFF as line 1 of the batch file cleans things up a bit by not enabling the file to display everything that's transpiring.

Paul K. Pagel
Enfield, CT

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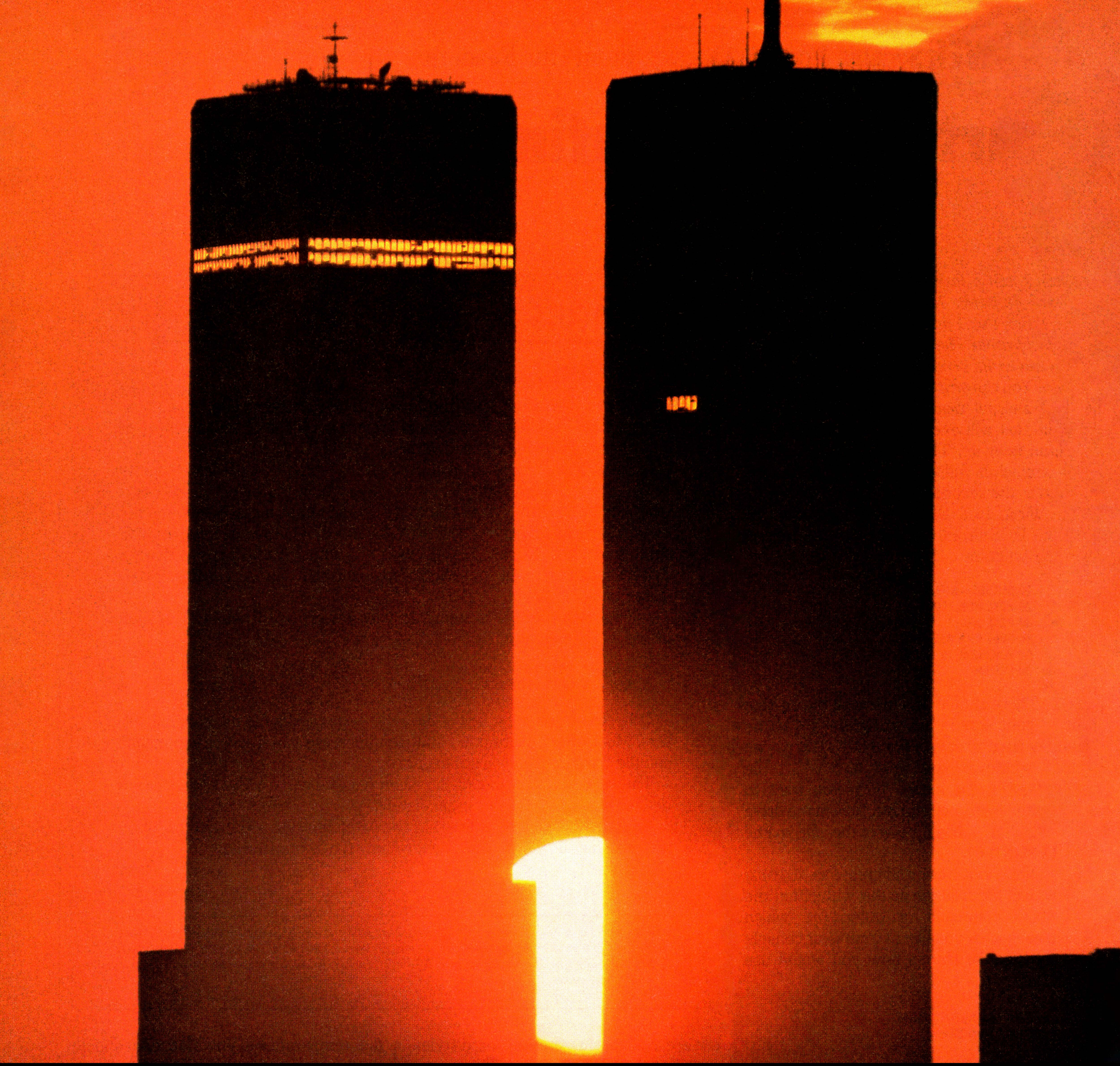
Q: *I recently lost some keyboard templates to WordPerfect and dBase III Plus when I moved my office. A couple of people in the office are learning to use these programs, so I'd like to have a supply of templates on hand. What do you suggest?*
A: You may want to purchase PC-Documate keyboard templates from Systems Management Associates. These are akin to mini-manuals that encompass the area around the command keys. .The templates provide more information than a mere listing of the function key commands, which should be a boon to beginners. Both of the software programs you use are available in most keyboard styles, including the IBM enhanced. The company also markets a "do-it-yourself" template that you can fill in. Ten templates cost $14.40 each; 25 cost $13.55 each. Phone (800) 762-7874 or write to the company at 3325 Executive Drive, Dept. B-16, Raleigh, NC 27609.

Q: *We leave the heat or air conditioning off in our country home when we are not there. In the summer the temperature can reach 110 degrees and in the winter it often falls below freezing. We recently purchased some computer equipment for the country home. Will the weather damage this equipment?*
A: Software is more susceptible to temperature extremes than hardware, but the temperatures you describe should not harm either your hardware or software. Floppy disks can generally tolerate temperatures ranging from 40 degrees below zero to 125 degrees above. Wait several hours before using your equipment each time you visit your country home. This will enable it to adjust to the normal room temperatures achieved when the heat or air conditioner is on.

There are additional precautions you should take. Do not leave your equipment by a window or anywhere else where it will be in direct sunlight, since these areas will be hotter than the rest of the house. Keep the equipment in a dry section of your home, not the basement, attic, an enclosed porch, or any other damp area. Cover the equipment to keep



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dust out. Unplug all your hardware. A power surge caused by a thunderstorm, for example, can damage equipment even if it isn't turned on.

Q: *I have a TRS 80 Model III from Radio Shack and have been using the Payroll Program #26-1556 to do my payroll. I also have an IBM-compatible computer and would like to use the Radio Shack program on this machine. I've tried other payroll packages, but the Radio Shack program seems to work best for me. Is there any way of converting the program for use with MS-DOS?*

A: Since you like the software you're using, it's probably a good idea for you to stick with it. Unfortunately, Tandy/Radio Shack knows of no way to convert the program.

Q: *We are interested in purchasing a fast hard disk drive (less than 30 millisecond access time) with at least 80Mb of storage capacity for our IBM XT. Do you have any suggestions?*

A: A 105Mb RLL (Run Length Limited) internal hard disk for XTs and compatibles has recently been released by Sunol Systems, Inc. The company says the product has a 29 millisecond average access time, which is faster than normal. It comes with a controller, manual, and cables, and retails for $1,995. Sunol Systems can be contacted at PO Box 1777, Pleasanton, CA 94566; (415) 484-3322. In addition, Tallgrass Technologies (11100 W. 82nd St., Overland Park, KS 66214; (913) 492-6002) markets an 80Mb drive ($3,395) that has an average disk access time of 30ms.

Q: *I own a CP/M based computer, the People from Olympia USA, Inc., and recently began using an IBM compatible at work. How can I get these two computers to "talk" to one another so I can use the same files at work and at home?*

A: The People, which Olympia discontinued in December 1985, is CP/M-based but can also read MS-DOS files, according to Tom Gallagher, Olympia's director of marketing. There are some problems, however. First, the DOS version the People uses is a "plain vanilla" version, Gallagher says, which is not compatible with PC-DOS. Second, you can't easily use disks from your compatible because the People uses 640k formatted disk drives instead of the 360k or 1.2Mb formatted drives found in IBM and compatible computers.

To read files created on your compatible, Gallagher suggests first loading the MS-DOS included with the People. Then type C: at the A> prompt and hit the return key, even though the People only has two floppy drives. Typing C: tells the computer you want to transfer a file created on an IBM compatible. Put the disk with files created at work in the B drive and copy them to the disk in the A drive.

Unfortunately, you can't reverse this process and use files created on the Olympia on your IBM compatible. If you have a modem in each computer, you can transfer files electronically. Make sure the files are in the ASCII format, leave your office computer on, and have the modem and communications software ready to receive files.

The People is one of several computers introduced a few years back that is MS-DOS- but not IBM-compatible. Software companies released versions of their packages specifically for these computers. If you own such a computer, it is worthwhile calling either the software companies or some of the larger distributors to see if they still have these versions in stock. This is probably your only way of finding compatible software.

Q: *I have an IBM PC XT compatible with a 20Mb internal hard disk. I back up data onto floppy disks. Is there a way to add a hard disk card to my system to serve as the backup device for data?*

A: Yes. However, be aware that there are pros and cons to using a hard disk card as your backup device.

There is no complicated installation required. Simply add a hard disk card to an empty slot in your computer. If the computer has a setup routine, you'll have to rerun it to tell the computer you now have a C and a D drive. You may also have to set dip switches on the hard disk card. For example, on the Hardcard 20 and Hardcard 40 from Plus Development (1778 McCarthy Blvd., Milpitas, CA 95035; (408) 946-3700), you have to change one jumper switch to tell the board that it is acting as the second hard disk. The 20- and 30Mb Drive Cards from Mountain Computer (360 El Pueblo Road, Scotts Valley, CA 95066; (408) 438-6650) automatically sense if there is another drive and configure themselves accordingly.

Besides ease of installation, there are other benefits: The cards are faster than floppy disks or tape backup units, and are usually less expensive than the latter. If you have room on the card after backing up data, you can use the card to store and to operate programs. The cards are ideal if you use a computer at home or occasionally travel to another office. You simply remove the card from the computer and install it in the other computer. (If you plan to do this, carry the card in the box and packaging it came in to protect it in transit.)

Since the key to a successful backup routine is to store the backup copies in a location that is separate from the computer, the downside to using hard cards can be serious. If files are lost because of physical damage to the original hard disk —say, the computer is dropped or there is a fire or a severe power surge—it is likely that the data on the hard card will be lost as well.

Q: *I own a Tandy 1000 with 256k of RAM and a DMP 200 printer. The program, Personal Deskmate, that came with the computer is not working properly. Whenever I am in the text section and have finished printing, the printer will output two extra sheets of paper.*

A: The problem of extra output can be solved easily. You are getting two extra sheets because your printer has not been configured to work with the Tandy 1000. Before starting Deskmate, you must make sure that the DMP 200 is set up to work with the computer. The DMP 200 is not an IBM-compatible printer, so you must set the dip switches accordingly. Set the NL/CR switch to CR. Now go to the DOS prompt and type LPINST and hit the enter key. You will be asked if your printer automatically feeds lines after a carriage return. Answer yes if your printer does. When you're finished, the DOS prompt will reappear on the screen, indicating that the printer configuration procedure has been completed. Now, whenever you run Deskmate the printer configuration will be loaded automatically. The LPINST command builds an AUTOEXEC.BAT file that is appended to any existing AUTOEXEC.BAT file.

If you are unsure about answering yes to the line-feed question, run a printout test. If the printer double spaces, return to DOS, run LPINST and answer yes. To turn the extra line feed off, type LF <CR>. At the system prompt, type MODE LFOFF <CR>. To turn the extra line feed on,

If you have questions dealing with hardware or software, PERSONAL COMPUTING *will try to answer them in this monthly column. Due to the volume of questions received, it's not possible for us to respond individually to each request. Send queries to Answers,* PERSONAL COMPUTING, *10 Mulholland Drive, Hasbrouck Heights, NJ 07604. Please include your address and daytime phone number.*

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type LF <CR>. At the system prompt, type MODE LFON <CR>. If you reset the computer, the system returns to its default setting, LFON. After you issue the appropriate MODE command, your Tandy 1000 will be configured to work with your printer.

Q: *Is there an economical way to transfer data from an IBM System 23 Data Master to an IBM PC or compatible?*
A: It can be done, but not economically. Data transfer can be accomplished by hooking the System 23 to an IBM System/36 PC, a multiuser/multiple-programming computer which offers 256k of RAM, expandable to 512k, and 8-bit storage and transfer time. Prices for the system start at $5,995. You can then download data to the IBM PC or a compatible using PC Support/36 software that will make use of a transfer command.

Q: *I have a Tandy 1000 EX, a DWP-230 printer, and Deskmate software. How can I get the printer to print a 25-column worksheet when the screen displays six or less columns at a time?*
A: Unfortunately, the DWP-230 printer does not offer printing in condensed mode. Therefore, you will not be able to print a large worksheet at one time. According to Tandy technical support, the best you can do is adjust your printer selections to print as much of the worksheet as possible on a single sheet of paper, and then tape the sheets together to form the whole worksheet.

To print a large worksheet on your printer you must adjust printer settings for print functions. To check the printer settings, press F11; then Alt-F6. The screen displays the current printer settings. Enter new values for each, or press Enter to use the current values. You can select the value for the left margin, printed line width, total lines per page, printed lines per page, and whether or not to double space, pause between pages, or to pause after each page in order to insert another sheet of paper.

To print a large worksheet you will type 0, then Enter for left margin and 80, then Enter for printed line width. Although an 8.5-inch page is 85 characters wide (10 characters per inch), the DWP-230 can only print 80 columns. On an 80-column printer, 80 is the maximum line width. After setting values, press F12 to return to the worksheet screen.

Since a 25-column worksheet is larger than one window, you need to select areas you want to print separately and then use the Print command. Move the cursor to cell 1, type R1C1 (row 1, column 1), then Enter. Press F7 for select. Press Shift and right arrow simultaneously to select the columns spanning the width of the screen. Press Shift and the down arrow simultaneously, then press the down arrow key to select the rows spanning the vertical length of the screen, and press Print. You will need to do this for each section of the worksheet and then tape them all together.

Q: *Do you know of any programs for accessing and/or creating macros for Lotus 1-2-3 and Symphony?*
A: There are several that you can consider. 101 SmartKey Macros for Lotus 1-2-3, from Macropac International ($49.95; 19855 Stevens Creek Blvd., Suite 168, Cupertino, CA 95014; (408) 996-8143) works with releases 1A, 2.0, and 2.01 of 1-2-3 and provides pre-typed RAM-resident macros. The package includes macros that add word wrap to 1-2-3; create graphics and slide-show presentations; and recalculate the range of a spreadsheet. It also includes a pop-up notepad, calendar and calculator.

Another package from Macropac, 101 Macros for Symphony ($69.95), works with all versions of Symphony. It permits the building of custom-made forms automatically; features automatic bold and italic type, page breaks, and margins in sheet mode; provides for the insertion of subtotal lines and instant subtotal calculations as well as the recalculation of spreadsheets by range; and includes the features available in 101 Macros for 1-2-3.

KeyMac ($49) for Lotus 1-2-3 release 1A and 2.0 enables you to create macros by using the "learn mode" to capture keystroke sequences in a buffer. It can also compress 1-2-3 multi-key instructions into a single keystroke. KeyMac is available from Fox & Geller, 604 Market St., Elmwood Park, NJ 07407; (201) 794-8883.

QuickMac ($129), also from Fox & Geller, works solely with 1-2-3 release 1A. With QuickMac, you can create macros from within 1-2-3. The program incorporates a keyboard macro facility that enables you to store and retrieve repetitive or frequently used keystroke sequences and reduces the six or seven keystrokes for each 1-2-3 macro to a single keystroke. It will also store frequently used sequences in a library that you build from linked subroutines.

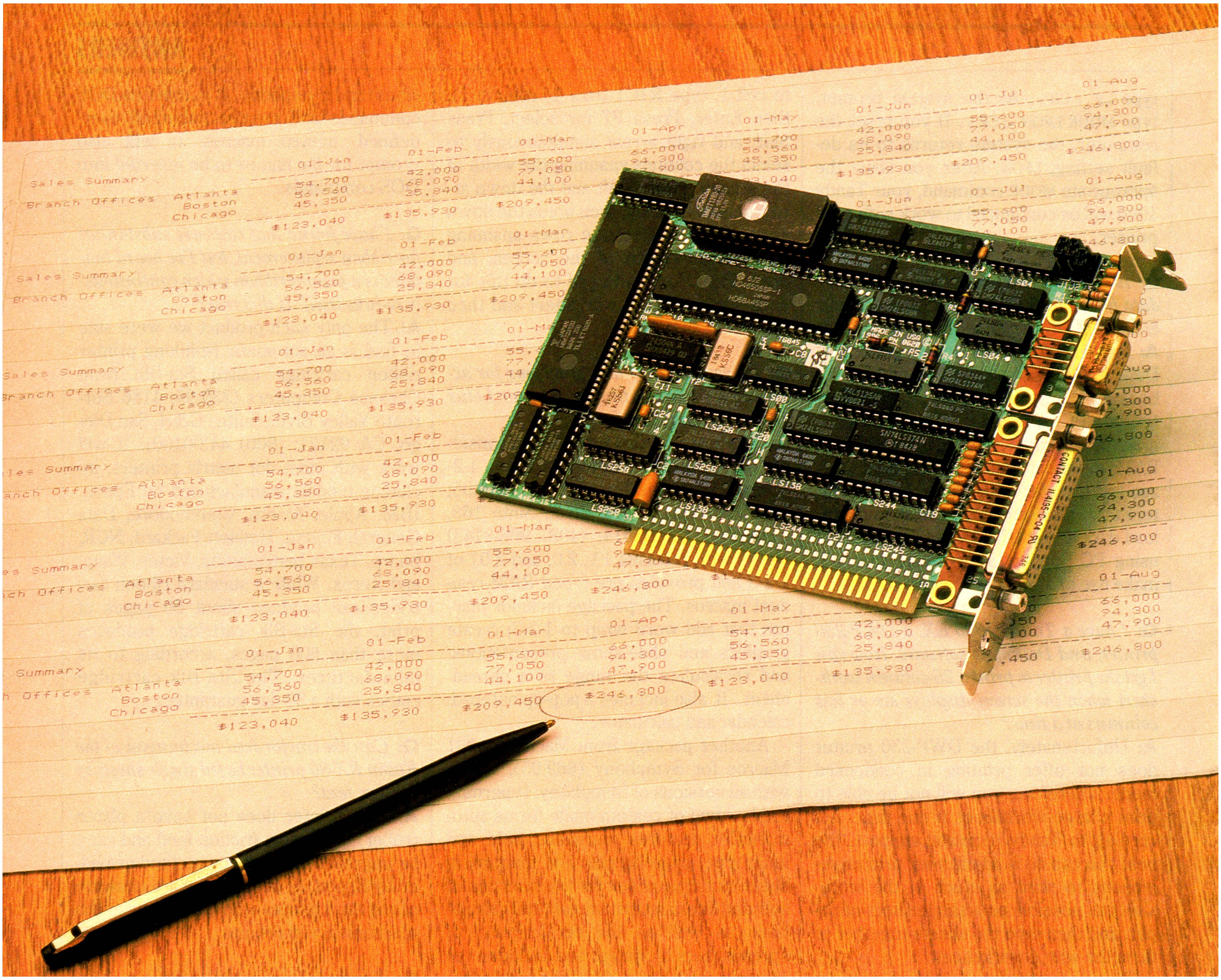
Menu System, from Cottage Industries ($49.95; 2024 Swift, Suite 211, North Kansas City, MO 64116; (816) 221-8088) works with both 1-2-3 (all versions) and Symphony. It automates DOS commands and creates unlimited user-defined, nested macros. It will also prompt for file names to be inserted into DOS commands.

Q: *I have found that costs are substantial for ribbon replacement, but I've heard that there is a printer ribbon which continuously re-inks itself. Is this true?*
A: The only such product we were able to find is an automatic re-inking printer ribbon cartridge called Sta-Blk from Chronos Computers ($39.95; 4186 Sorrento Valley Blvd., Suites G&H, San Diego, CA 92121; (800) 443-0100). It will work with most dot matrix printers, including models manufactured by Epson, IBM, Apple, Axiom, Commodore, Data General, Fujitsu, Hewlett-Packard, NCR, Sharp, Texas Instruments, Victor, Wang, and Xerox. While a standard ribbon cartridge can produce about 50 pages of print, the Sta-Blk cartridge produces more than 500 pages, according to its manufacturer. The Sta-Blk cartridge comes with a 30-day guarantee.

Q: *Can the tractor-feed mechanism of the Epson RX-80 printer be fed single sheets by friction feed?*
A: This printer does not have a platen (roller) to support friction feed and can't be upgraded through any method provided by Epson. At present, we are unaware of any third parties who manufacturer the mechanism you require.

Q: *I own a Tandy 1000 with two 360k floppies, a 384k Memory Plus Board, and a 300-bits-per-second modem board. How can I upgrade to 640k of RAM? Also, what kind of internal hard card would give me 20Mb and let me keep both floppy drives and the modem? I want a hard card that will not need an extra power supply.*
A: To upgrade to 640k you will need to purchase the 256 Parity Memory Kit ($99.95, part #25-3062) from any Radio Shack dealer.

Installing a 20Mb hard card in your Tandy will not require an extra power supply. Your Tandy 1000 has three slots, and at present you have only two occupied, one with the Memory Plus Board and one with the modem board. The Tandy 20 Meg Hard Disk Card ($799, part #25-1029) mounts into a 10-inch slot and will fit perfectly into the 1000. It comes with software and directions for installation. The 20 Meg Hard Disk Card works with MS-DOS version 2.11 or later. DOS will identify the hard disk as drive C. ■



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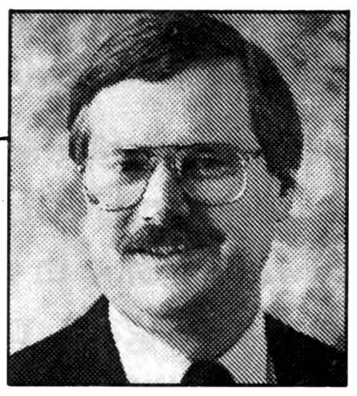
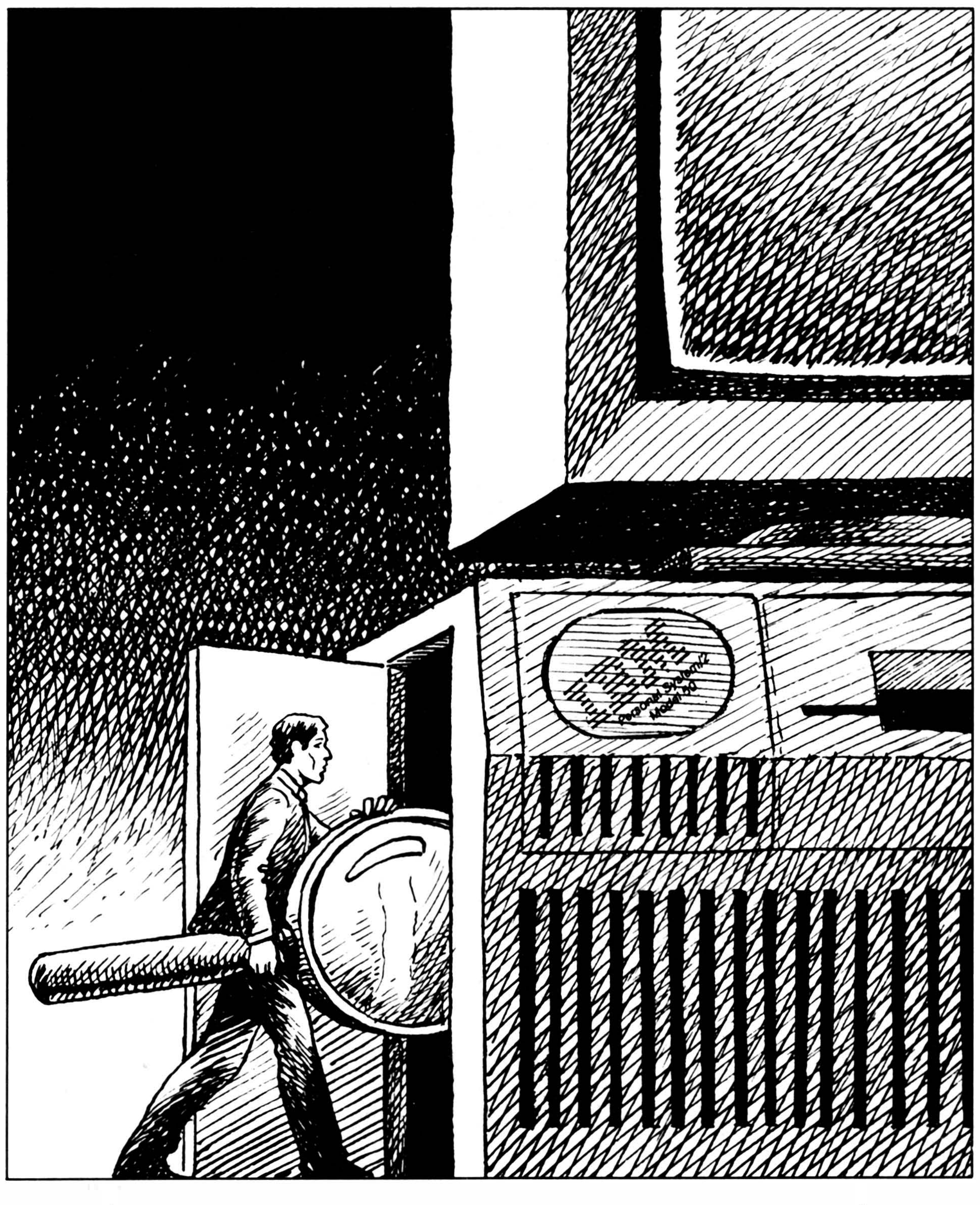


Inside IBM's PS/2 Line



In 1981, IBM built its original PC from an assemblage of standard parts available to any manufacturer. It wasn't a very special unit, but it was IBM. Even way back then IBM could have used the 16-bit 8086 processor for the PC instead of the less capable 8-bit 8088 it finally chose. Not until 1987 did the company offer an 8086, on its Model 30 PS/2 computer. For an operating system on the vintage PC, IBM offered not only Bill Gates' MS-DOS, but also the reigning 8-bit operating system of the time, CP/M. The whole design effort had a casualness about it unusual for IBM. In fact, the PC was produced quickly to fill a perceived niche—one expected to account for, at best, a few hundred thousand unit sales over its lifetime. The reality amazed even IBM, and the eventual PC/XT/AT line changed personal computing. For its second-generation personal computer, IBM apparently decided it would do the job right.

While retaining functional compatibility with the PC/XT/AT generation, the world's largest computer company altered virtually every aspect of its new products, for the first time creating a true system, one that justifies the name Personal System/2. This system concept goes beyond the operation of the computer itself, embracing not only mainframe links, but also the machines' design and manufacture. That design accommodates marketing plans as well as estimates of the way you will use and even handle the computer. Underpinning the system design is a core of advanced technology—not cutting-edge technology, but proven, state-of-the-art stuff.

As you might expect with a product line that's also a complex system, the boundary between new technology on one hand and advanced design on the other sometimes blurs. Practically every change IBM made is due to at least one—and sometimes two or three—utilitarian reasons. It may be a marketing reason, a technology advance, or an engineering requirement. There's been plenty of comment on the new computers, not only in the computer magazines and journals, but in the *The Wall Street Journal*, *The New York Times*, and many mainstream business journals as well. In the process of looking at the features of the PS/2 computers, it's easy to overlook what makes the features possible—the technology and design work at the foundation of what promises to be a very long-lived generation of computers.

One aspect of the PS/2 line got immediate attention, the new VGA graphics capability. This graphics mode for Models 50, 60, and 80 offers somewhat higher resolution than EGA (640 by 480 pixels versus 640 by 350 pixels for EGA), but the real surprise comes in the number of colors, up to 256 of them from a palette of 256,000. The eye might not easily distinguish the colors, but there are even more than that; the Mac II offers a palette of up to 16 million colors.

The highest-resolution VGA color mode, however, offers only 16 colors at a 640- by 480-pixel resolution. The 256-color mode permits only 320- by 200-pixel resolution. The latter resolution may seem modest compared to EGA's 640- by 350-, four-color display, but it's long been recognized that color is a good substitute for resolution in helping the eye separate small items. The ability to display 256 colors on a screen—even at 320- by 200-pixels—goes a long way toward making possible stunning photo-like images on a computer.

But there's no magic here. The trick is in the analog monitors IBM unveiled along with the PS/2 computers. Analog has been around a long time; a TV is an analog device. For the past several years, IBM has offered what it calls the PGC (professional graphics controller) as a several-thousand-dollar option for PCs. Its advantage is the wide color palette obtained with an analog monitor.

What IBM has done is refine its thinking and apply existing technology in a better way. However, those who invested in multiscan monitors like NEC's MultiSync now look prescient. After some early confusion, it's now clear that such products work fine with PS/2, if you add the requisite plug adapter. These monitors are cheaper than IBM's new ones and work with both the existing PC/XT/ATs (and clones) and the PS/2s. IBM's analog monitors work only with the PS/2s.

IBM's combination of a cheaper product with greater performance in the monitors exemplifies the care with which it proceeded in PS/2 design. As more than one analyst has noted, this time the company did its homework. And reduced cost of manufacture was high on IBM's list. It's been widely noted that the new computers will be made in a brand-new, highly automated factory. What IBM hasn't spelled out is that some of the design features that lend themselves to this sort of production also yield a smaller footprint, lower power consumption, reduced chip count, easier repair, and greater profitability. Gaining several objectives with one strategy is a sure sign of superior design. Design elegance, it's called. Such design, even more than cutting-edge technology, is the real story behind PS/2.

For example, you don't get automated production by hand-soldering anything. Yet a typical PC is a maze of chips fastened to boards, and some hand soldering is required. Although machines do most of the work in soldering PCs today, the more elegant method is known as surface-mount soldering. In this method, a tray loaded with chips passes upside-down over a bath of molten solder. The solder adheres to the pins of the chips, which are then placed on a circuit board by machine. The board and chips pass through a flash oven, fusing the chips to the board. This is how IBM makes PS/2s. The term "surface mount" comes from the fact that the assembly machines fasten chips to the surface of only one side of the circuit board, instead of forcing the pins through the board. IBM can position surface-mounted chips much closer together than it could those assembled by standard means. Surface mounting makes the computer smaller *and* reduces production costs.

Another advanced manufacturing process that benefits user and manufacturer alike is the injection moulding for the plastic frame holding the disk drives, hard disk controller, add-in cards, speaker, and fan on the Model 50. These parts fit together in an interlocking pattern that is secure yet easy to disassemble. For the user this means less hassle when adding boards or swapping drives; for the manufacturer it means a fast production line and lower costs.

The chips IBM used wherever possible in the PS/2 line are VLSI (very large-scale integration) superchips. These combine the features of many standard chips in a single large chip. The resulting superchips operate faster, employ proprietary elements, use less power, and work more reliably than an assembly of chips mounted on a board. IBM representatives, in fact, note that they have reduced three of its full-size boards (mono graphics, CGA, and EGA) to a single graphics chip in PS/2 computers. Likewise, the company has reduced the floppy drive controller, parallel and serial ports, and other functions to oversized silicon, known as VLSI custom gate arrays. These arrays employ low-power CMOS technology, permitting the computers to use smaller power supplies than earlier models. Despite all the chip squeezing, however, the chip count is not terribly low. A Tandy 3000 with disk controller and graphics boards has a lower chip count than the IBM PS/2 Model 50 (131 for the Tandy versus 150 for the Model 50).

The part of the PS/2 line that has caused the most consternation among users—and the greatest compatibility problems—is the new bus, the Micro Channel architecture (MCA). Statements at IBM's April 2 introduction likened Micro Channel to a multilane highway, as compared to the single-lane blacktop of the current PC bus. This implies a vast difference in capability, far beyond what's actually likely in most situations. The significance of MCA lies in the future, when extension to OS/2 will permit powerful links to networks and mainframe systems. The main difference now is that users cannot use any existing PC add-in boards in the Models 50, 60, or 80 because the Micro Channel bus is completely different. Nor can manufacturers achieve compatibility by revising the connections on existing

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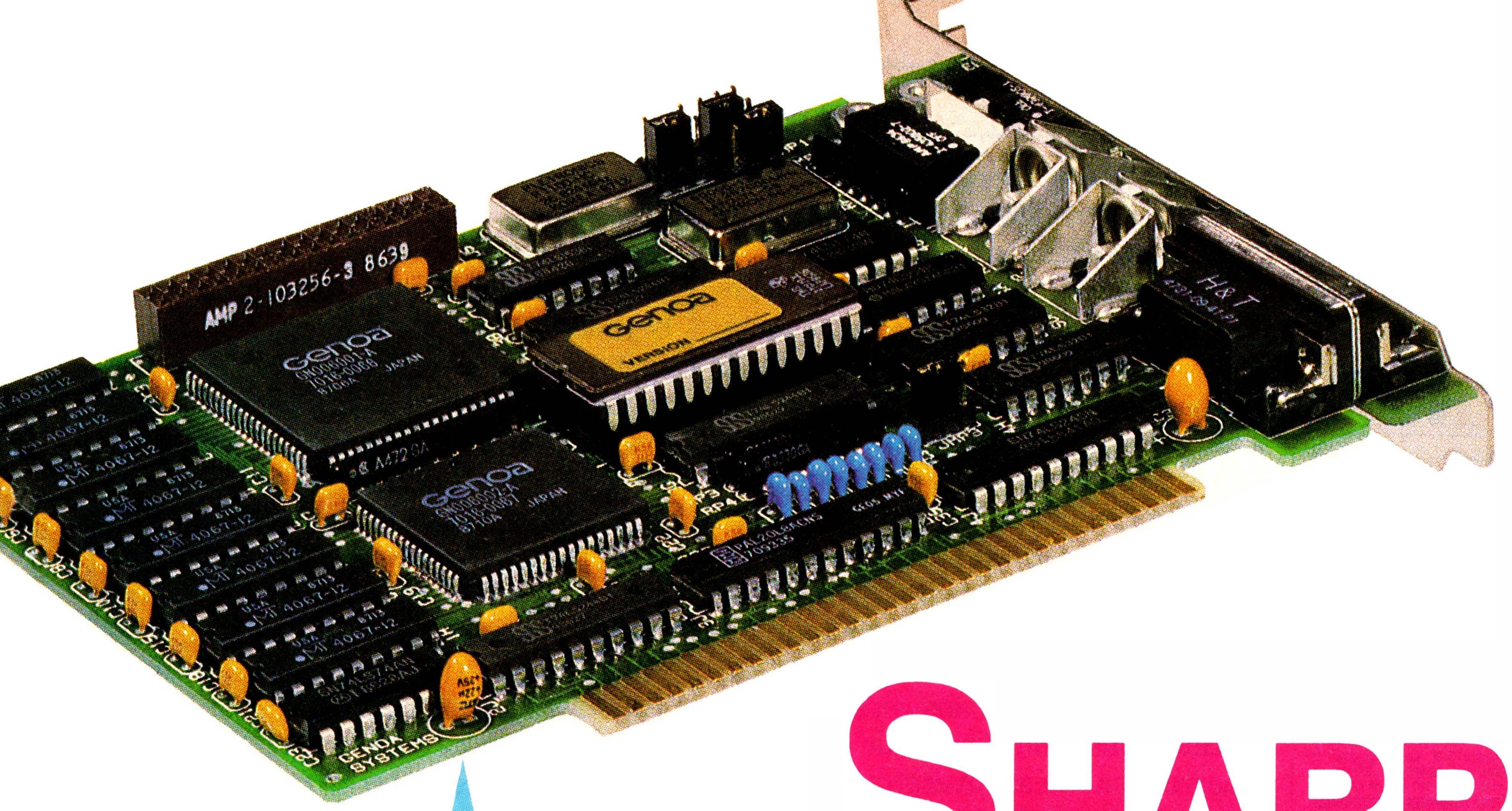

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boards. The way current boards interact with a computer is different from how PS/2 boards interact.

The prospect of having to scrap an entire generation of add-ins affected engineers, product developers, journalists, and hackers like a heady drug. Quickly formed PS/2 special-interest groups on such information utilities as The Source, CompuServe, and BIX (Byte information exchange) buzzed with activity as industry insiders tried to unearth the *true* significance of the Micro Channel—and the host of other PS/2 announcements. Almost hourly, queries, answers, technical specifications, and diagnostic programs appeared on these overgrown bulletin boards. Soon pin-by-pin specifications—with analyses—were in place for all to see, even before IBM's own technical reference manuals were widely available.

It was reported on BIX that clone-maker Michael Dell of PC's Limited claimed Micro Channel is similar to IEEE 696, the bus standard used in the venerable S-100 bus, which predates even CP/M computers. The S-100 arbitration (pin assignments) is also reminiscent of the Macintosh's NuBus. Dell's claim isn't really surprising in view of the fact that IBM developed the basics of the S-100 bus, but it does suggest that in personal computing things often actually change less dramatically than they seem to.

Though it does not lack antecedents, and though it does cause incompatibilities, the Micro Channel architecture is a true advance over the PC/XT/AT bus. In particular, MCA supports an auto-sense feature that identifies whatever equipment is present on a PS/2 computer and supports advanced peripheral handling in a multitasking environment. When IBM representatives showed off their equipment on April 2, auto-sensing (along with the absence of screws) was the piece de resistance. Here's a computer that can detect what monitors, boards, and peripherals you have connected. And if you change something when the computer is off, it senses that on power-up. MCA accomplished this by having the computer check the devices recorded as present in the setup RAM against the actual equipment. If a difference exists, the computer runs a configuration program to correct the setup RAM. Then the computer writes this information back to the peripheral. Nothing comparable exists on current personal computers.

The other advance in the Micro Channel is better peripheral support, the feature that gave rise to IBM's superhighway analogy. In the PC/XT/AT generation, many interactions between the processor and peripheral devices (disk drives, monitor, modem, printer, and keyboard) take place by issuing interrupts. The processor issues a command to the printer, then halts operation for a few clock cycles by issuing an interrupt while awaiting a response (such as "I'm printing, I'm printing..."), then goes on to other things. By polling peripherals in sequence, the processor can appear to do several things at once. But existing PCs can issue interrupts only one at a time. This limitation doesn't affect most operations, and tricks such as print spoolers prevent the computer from hanging up while waiting for peripherals to complete their tasks.

All this will change in the multitasking world that OS/2 (the new operating system promised next year), combined with 80286 or 80386 processors, will open. That world will consist of many "virtual" DOS sessions taking place at once. To the user, each session will have the same appearance as a complete computer session does now. What happens when a couple of such sessions issue interrupts at the same time? An 80286 processor can handle such complexity, as can OS/2, but not an existing PC bus. The reason is that the interrupt condition on a PC/XT/AT is indicated by setting a memory location to the so-called high bit (one). When the interrupt is removed, the location is reset low (to zero). The processor polls this location to determine the interrupt status. At any one time it's either on or off—no multiple interrupts are possible.

With Micro Channel architecture, on the other hand, the processor polls the bus lines themselves to see whether they are low or high. Since MCA provides several designated interrupt lines, the system can handle a number of interrupt conditions at once. This business of interrupts is important not only for local multitasking, but also in networks and mainframe links. One of IBM's fondest hopes is that PS/2s—supported by the Micro Channel bus—will become each individual's local link to IBM's vast mainframe environment. That's the real secret of the new bus, and of the Personal System/2 as a whole. The product was engineered as a system itself, one that can and will plug into a larger system of dedicated communications lines, minicomputers and mainframes. PS/2 is the personal part of the IBM big plan for systems integration. ■

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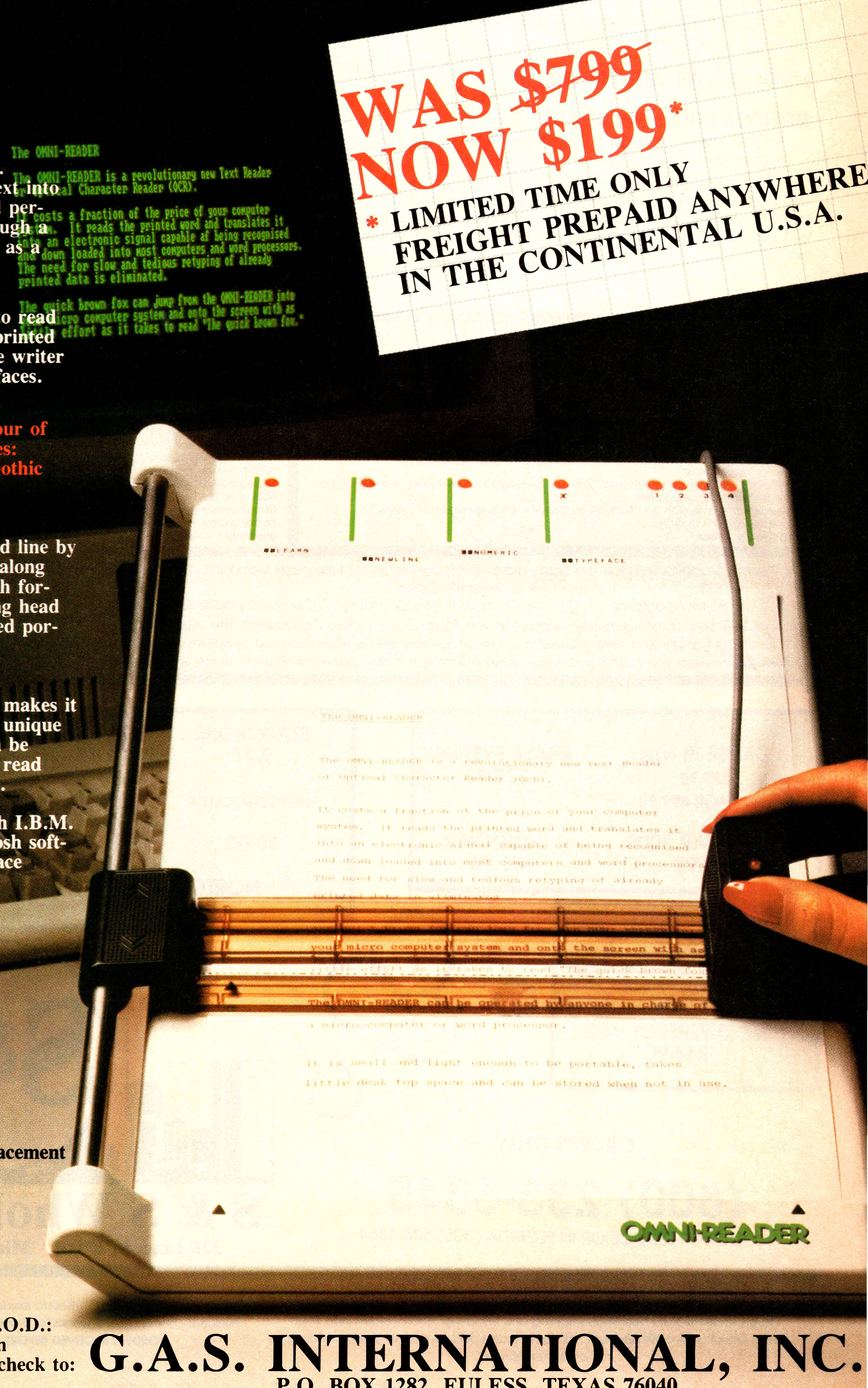

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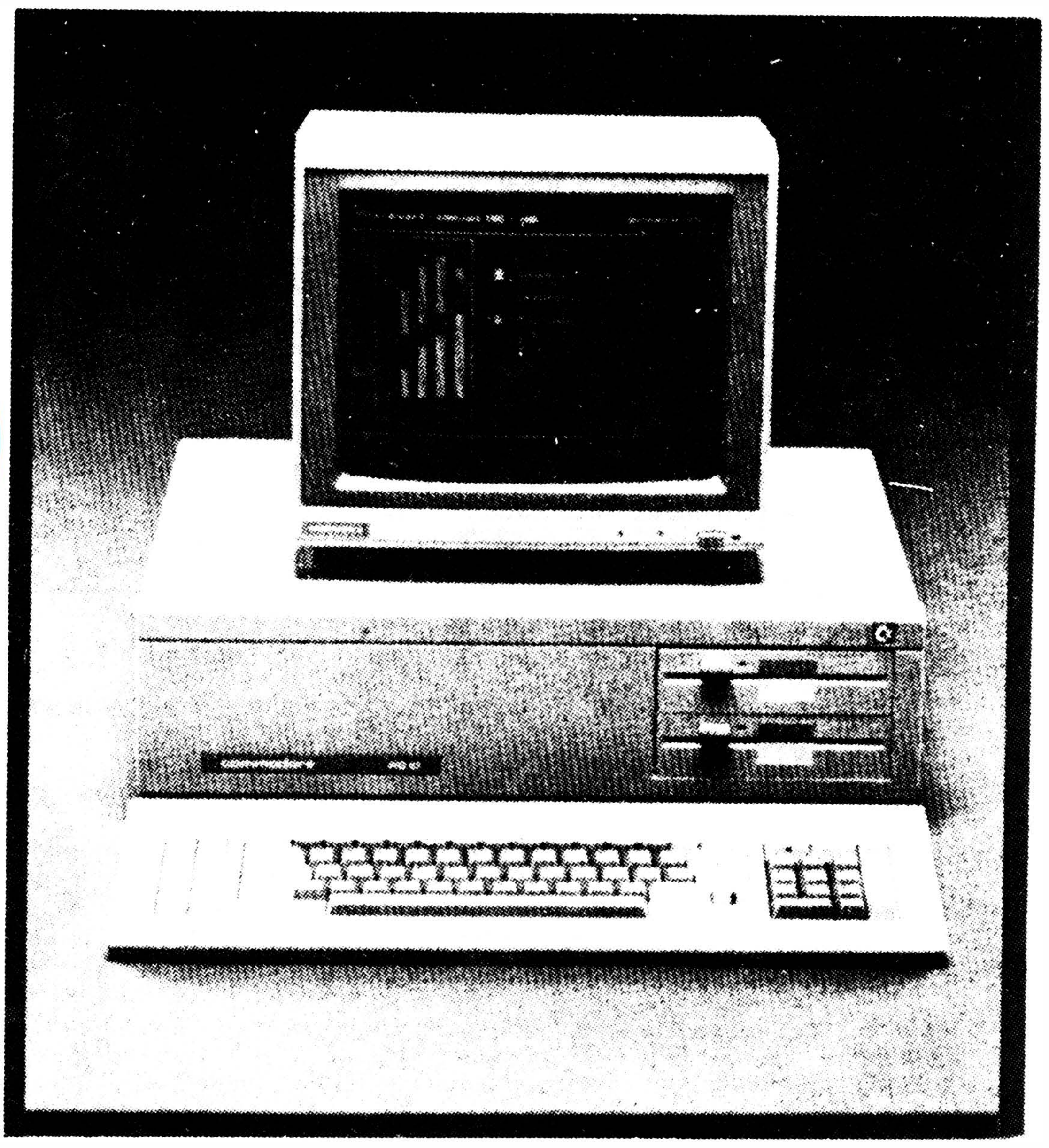

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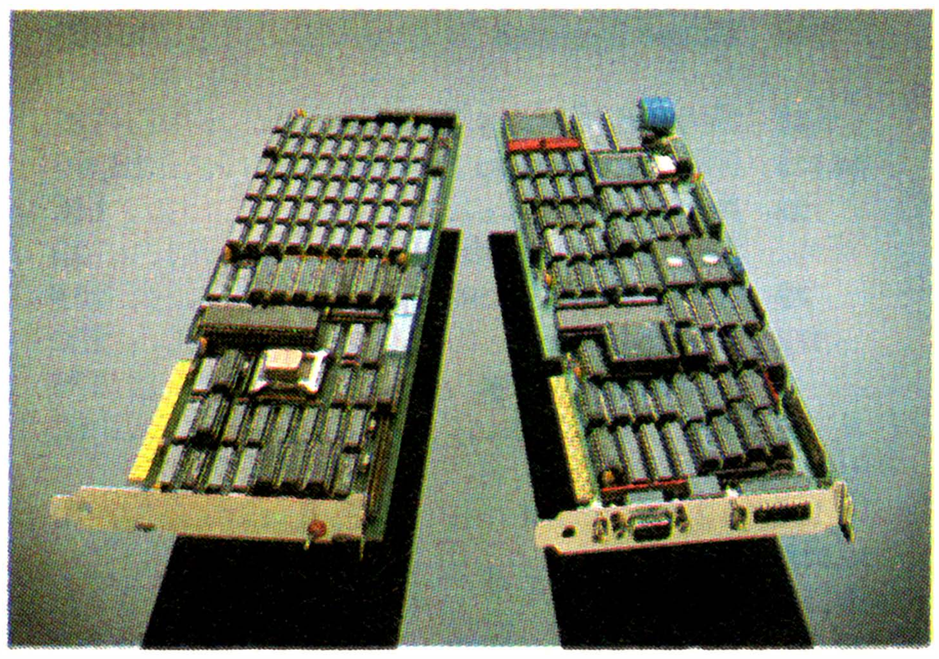

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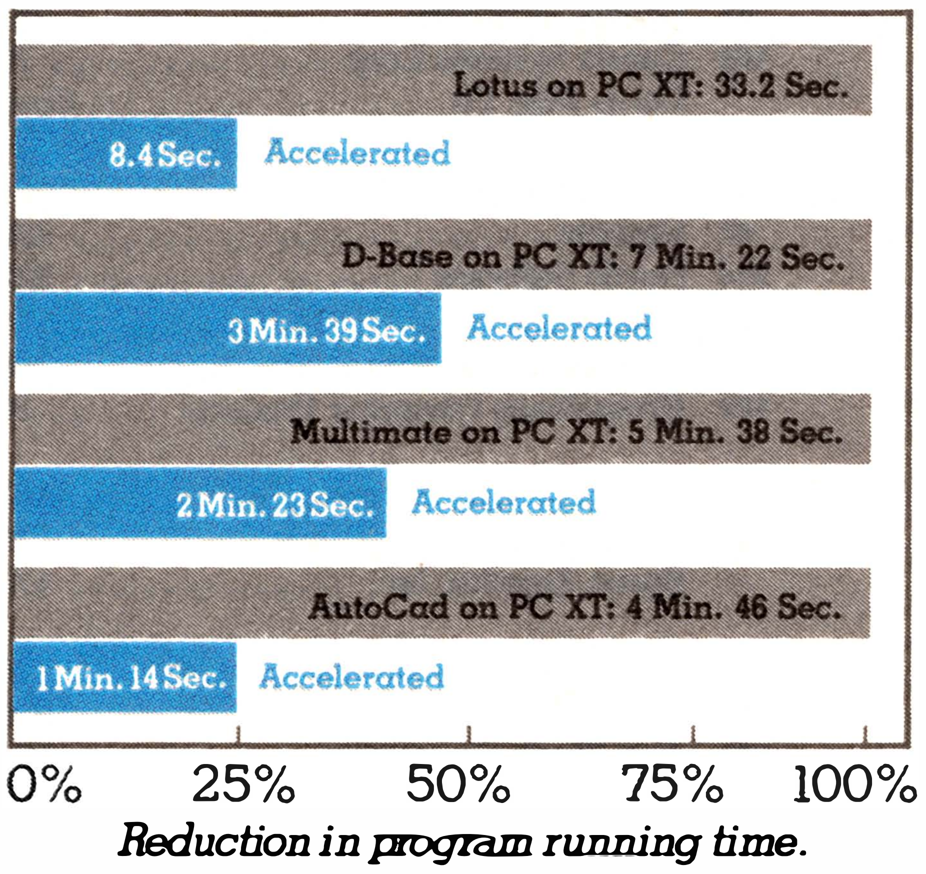

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(For More Information Circle 99)

DATA BANK

Computers With Connections

In this premiere DATA BANK column, a compilation of facts of interest to personal computer users, we look at business use of personal computers as part of a connectivity strategy. We found that personal computers connected to minicomputers, mainframes, or local area networks (LANs) are still relatively rare birds in business. Most of us keep our personal computers truly personal, linking them at most to an on-line service or electronic mailbox.

But the number of computers linked to others in some way *is* growing. The numbers and graphs below do the talking. They indicate that, while still rare, the bird is spreading its wings.

PCs IN NETWORKS

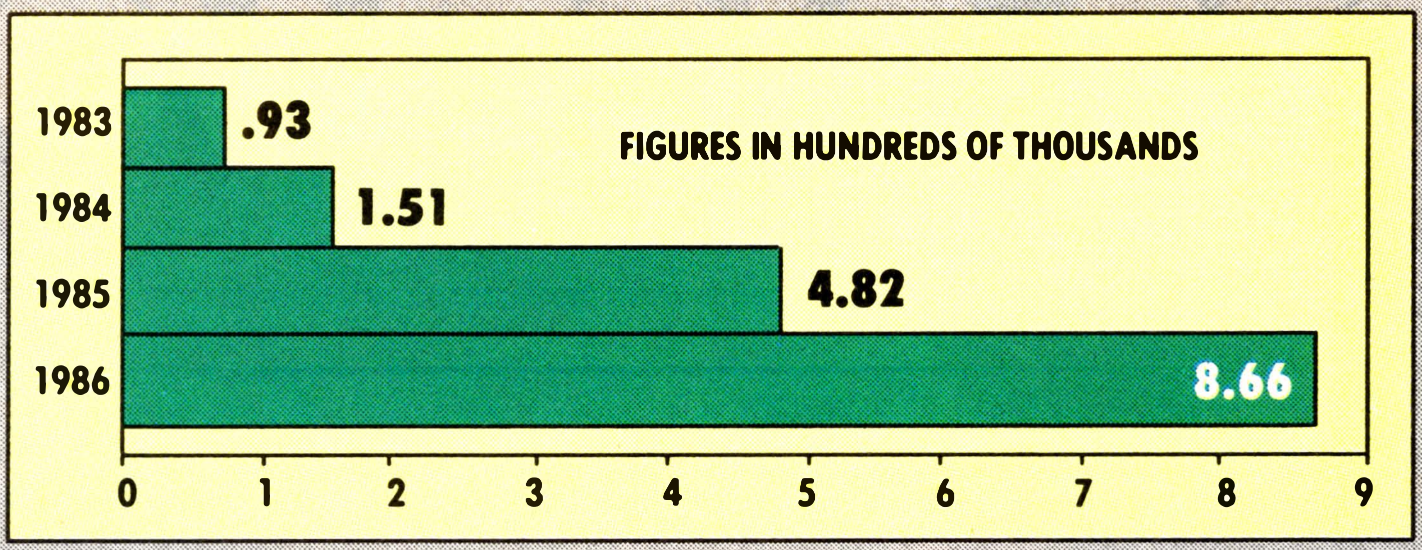
Personal computer brands connected to a minicomputer, mainframe, or LAN.

MANUFACTURER	%
IBM	50.3
TANDY	7.3
DEC	5.1
APPLE	4.3
WANG	3.6
COMPAQ	3.0
HEWLETT-PACKARD	2.4
EAGLE	2.0
TEXAS INSTRUMENTS	1.7
SPERRY	1.5
KAYPRO	1.5
ZENITH	1.5
OTHER	15.8

SOURCE: COMTEC MARKET ANALYSIS SERVICES, THE GARTNER GROUP

NETWORKED PCs

The number of personal computers in networks by year.



SOURCE: INTERNATIONAL DATA CORP.

NETWORKED COMPUTERS BY COMPANY SIZE

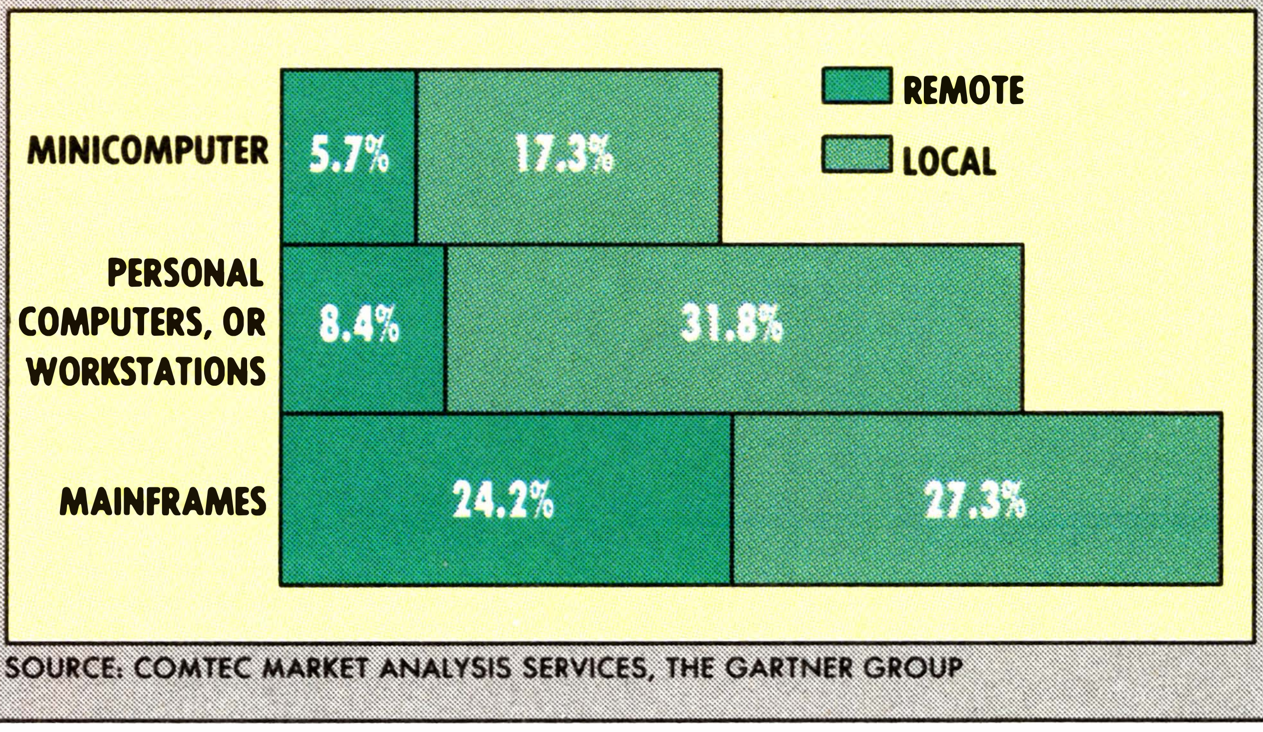
The number of personal computers and terminals linked to minis or mainframes by size of company in Fortune 1000 firms.

EMPLOYEES	PCs PER SYSTEM	TERMINALS PER SYSTEM
Less than 100	8.0	30.4
100 to 499	16.8	72.9
500 to 999	20.8	74.3
1,000 to 4,999	86.1	232.0
More than 5,000	88.9	508.9

SOURCE: DATAQUEST

NETWORK PARTNERS

The percentage of all PCs linked to minis, mainframes, and other PCs or workstations. "Local" refers to computers linked at the same site. "Remote" means computers at separate locations.



SOURCE: COMTEC MARKET ANALYSIS SERVICES, THE GARTNER GROUP

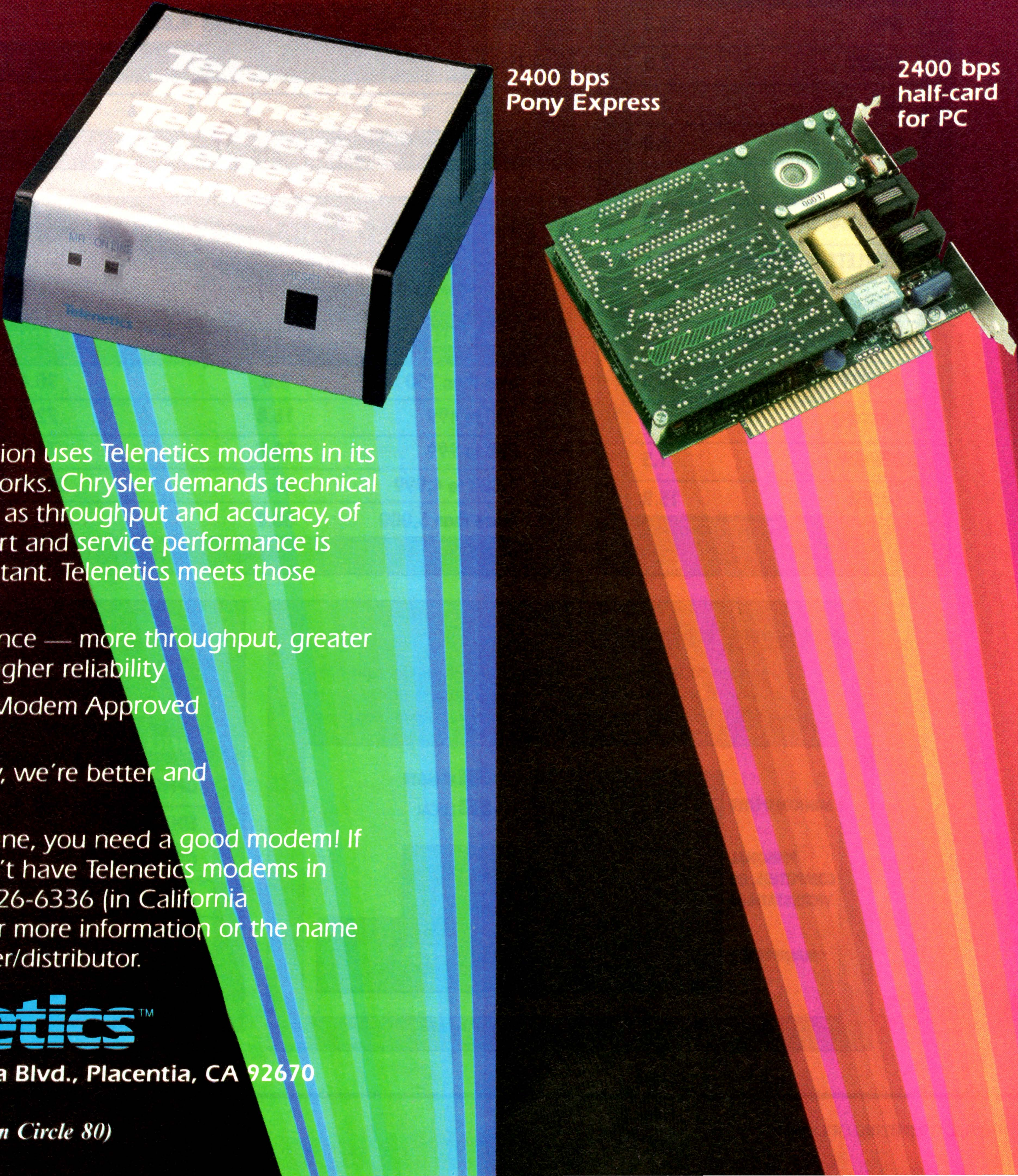
NETWORK OFFICE ENVIRONMENTS

Where LANs are used.

OFFICE ENVIRONMENT	%
OFFICE	64.4
EDUCATION	10.9
GOVERNMENT	9.3
MANUFACTURING	8.0
OTHER	4.1
MEDICAL	3.3

SOURCE: INTERNATIONAL DATA CORP.

Why Does Chrysler Use Telenetics Modems In Its Data Networks?



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(For More Information Circle 80)

ESSAY / Jack Bell

Dominatrix On The Desktop

SEX. Now that your interest has been piqued I can tell you that the 1980s aren't the proper times for priggish Victorians. You know who you are. And please don't phone.

From the latest toothpaste with "improved" sex appeal to condom ads (there, I said it) on television, from AIDS to herpes, cankers to wankers, there's simply no escaping sex.

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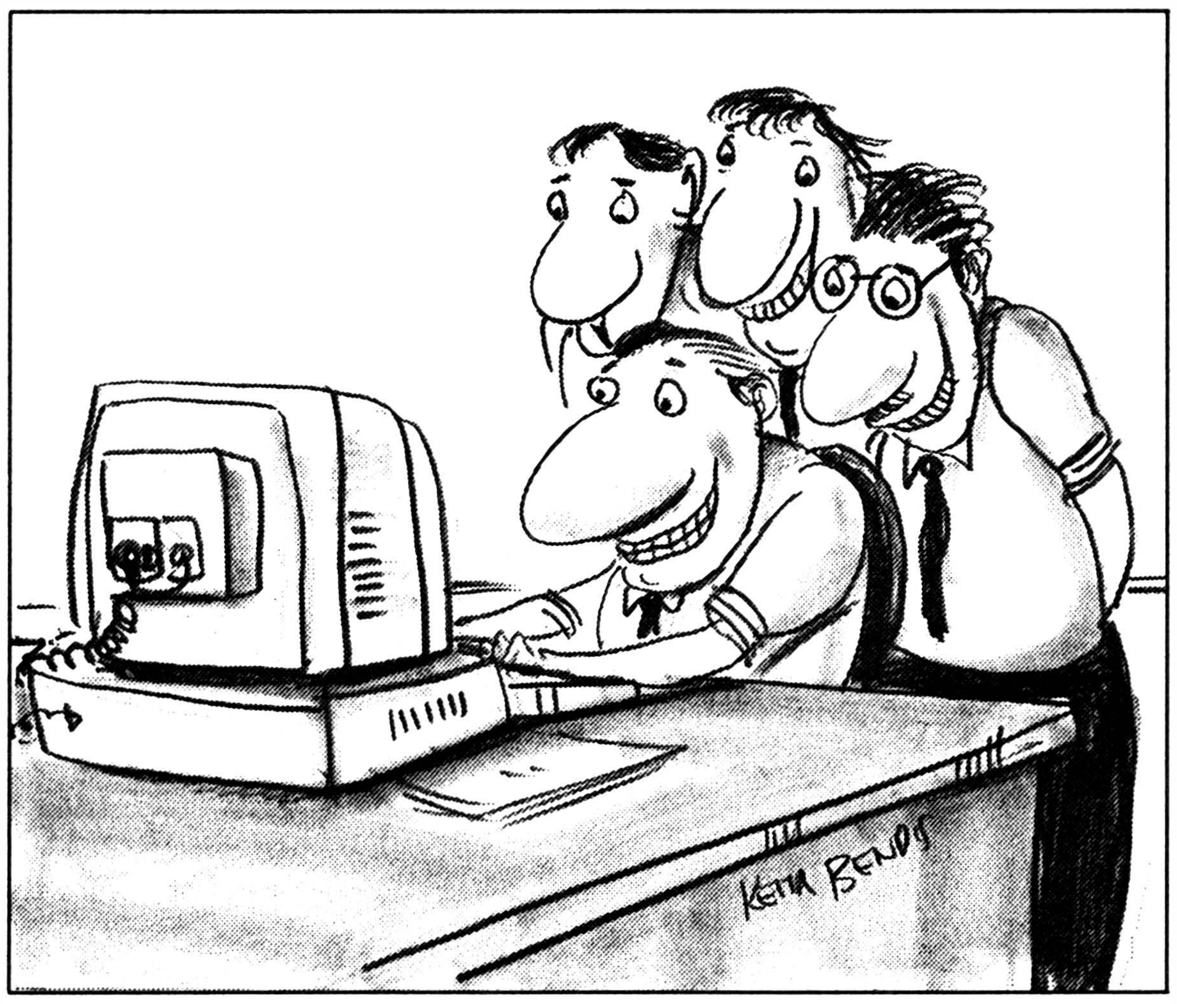

KEITH BENDIS

So perhaps I shouldn't have been surprised when I first booted up my "evaluation" copy of MacPlaymate. There she was . . . Maxie, naked and spreadeagled, and ready to entertain your wildest electronic fantasies. The "adult" software program arrived less than 24 hours after I placed that sweaty-palmed phone call to Pegasus Productions, the Greenwich, Conn., software company that markets what it is calling an erotic simulation.

Is MacPlaymate pornographic? I suppose so, but that's not saying much these days. Does it have redeeming social value? Probably not. Will it raise productivity? Not bloody likely, mate. Do we need this kind of software? After all, we seemed to be getting on pretty well without it.

If the program's author, Mike Saenz, a 27-year-old native of Chicago, is to be believed (and why shouldn't he be?), MacPlaymate is merely an individual's reaction to and against "the stodginess I see in the Macintosh industry. I'm an evangelist for desktop creativity versus productivity.

"It is becoming more and more depressing for me," Saenz says. "I see a real lack of creativity out there. MacPlaymate is a radical move borne out of frustration. Yes, MacPlaymate is boring and it's as sexist as hell. But I don't think of it as pornography, it's hard erotica. It certainly does titillate a lot of people."

Such as . . . some women in the personal computing industry who have asked Saenz to write a version of MacPlaymate featuring males. Such as . . . members of the gay community, stigmatized and terrorized by the spread of AIDS, who would also like to see a male version. And such as . . . a married couple who told Saenz that the program helped them improve their sexual relationship. One can only imagine what United States Attorney General Edwin Meese thinks of MacPlaymate.

How does MacPlaymate play in the Bible Belt? Don't ask. What about San Francisco? Ask the assistant district attorney, who, upon seeing MacPlaymate in action last January at the MacWorld Expo, summoned the vice squad. "He threatened to shut the booth down if we didn't stop displaying it," Saenz says. "He was right. We were in violation of certain penal codes that make it a crime to display pornographic material in an area where minors might see it."

So much for sex education personal computer-style.

Exactly what is MacPlaymate? I was hoping you'd ask. It's an adroit, even diabolical, answer to every parlor snake's fantasy, a dominatrix on the desktop. There she lies, moaning with uncharacteristic zeal, as the player puts Maxie through her paces, grabbing sex toys (vibrator, pulsating hands, etc.) from a palette of toys. Of course the Mac's bit-mapped graphics and pull-down menus get into the act. By accessing the Sex Partners menu, you can see Maxie strike a relaxed pose in a selection of outfits from the plain (your basic nude) to the extreme (in full bondage attire, spiked heels and all). All in triple-X animation. Definitely not the sort of woman to bring home to mom. Dad . . . perhaps.

Of course, most self-respecting and enlightened individuals will understand that some people might find MacPlaymate unspeakably offensive should they meander into the office and see and hear Maxie. To guard against possible embarrassment, Saenz included a Panic Button/Boss Switch that, when clicked on with the Macintosh's mouse, brings a Microsoft Excel spreadsheet listing a series of Apple computer dealers onto the screen, thereby providing effective cover.

Basically that's it. Sit back and relax . . . if you can. It's enough to make grown men cry—Saenz says some have after seeing MacPlaymate in action. Tears of joy, no doubt.

What could possibly motivate a successful software developer to write MacPlaymate? Good question.

Saenz says that he was stung by criticism of ComicWorks, an inexpensive animation/graphics program, which has since been repackaged, renamed, and enhanced by MacroMind for Mindscape, Inc., as GraphicsWorks. They said it was a low-grade form of literature," Saenz explains.

"I'm not the Al Goldstein of the Mac industry. I don't want to be," Saenz says. "I wanted to see how far I could go. I was also unhappy about the proliferation of the 'ugly document,' [produced by] people with no graphics, typographic, or publishing training who expect software to think for them.

"And through computing we'll see simulations that will fulfill our dreams," he says. There are a lot of people out there who dream of seeing the MacPlaymate in the flesh. I wanted to address it [or undress it] and make a parody of it."

Where does it all end? It doesn't; just ask Dr. Ruth. In the words of MacPlaymate's author, the program is "software for the '80s, thrills without the threat of disease."

If the notion of pornographic software offends you, I offer this morsel of advice—save your rage, chagrin, and $49.95 and don't buy MacPlaymate. It's that simple. ■

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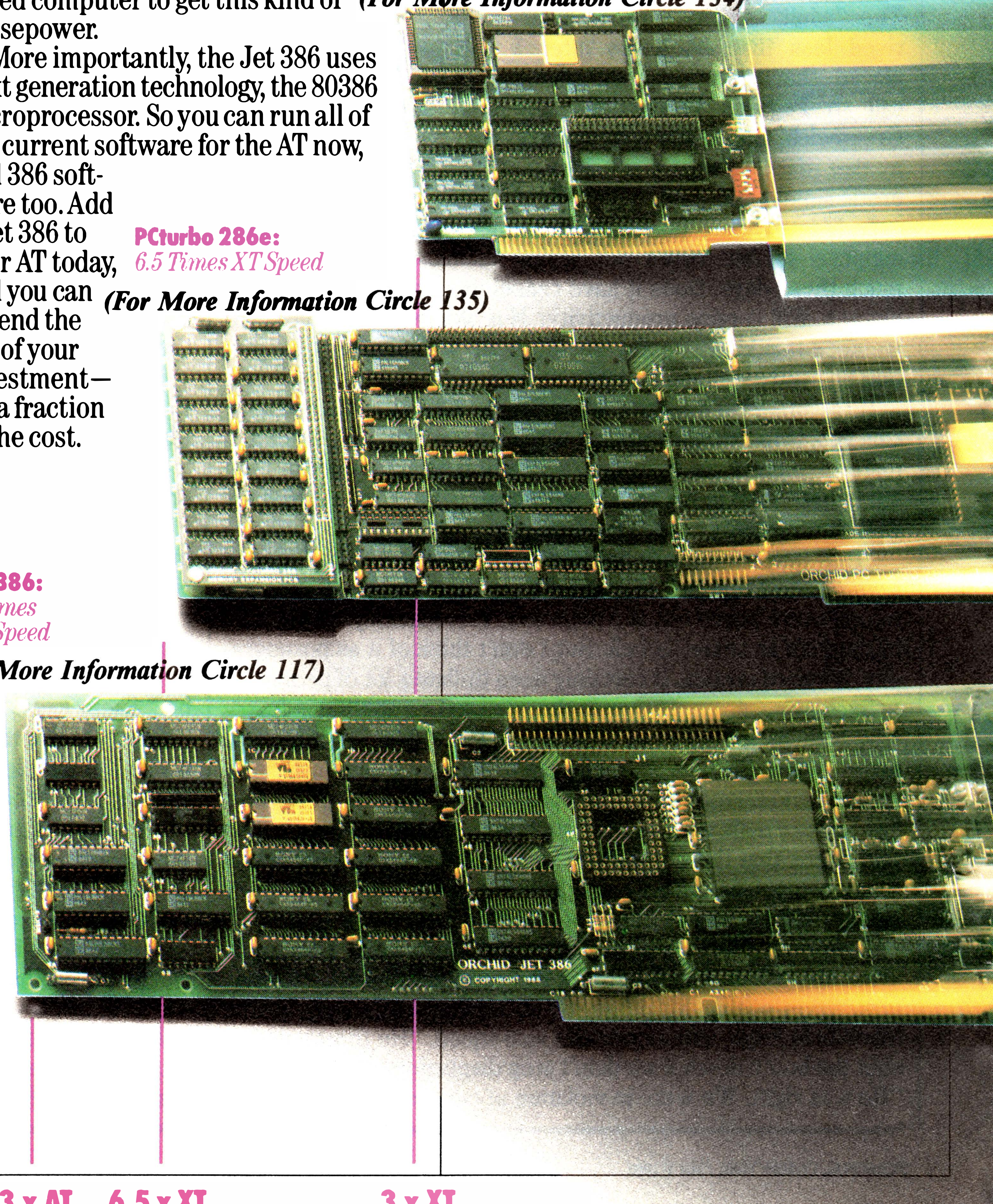

TinyTurbo 286:
3 Times XT Speed

(For More Information Circle 134)

PCturbo 286e:
6.5 Times XT Speed

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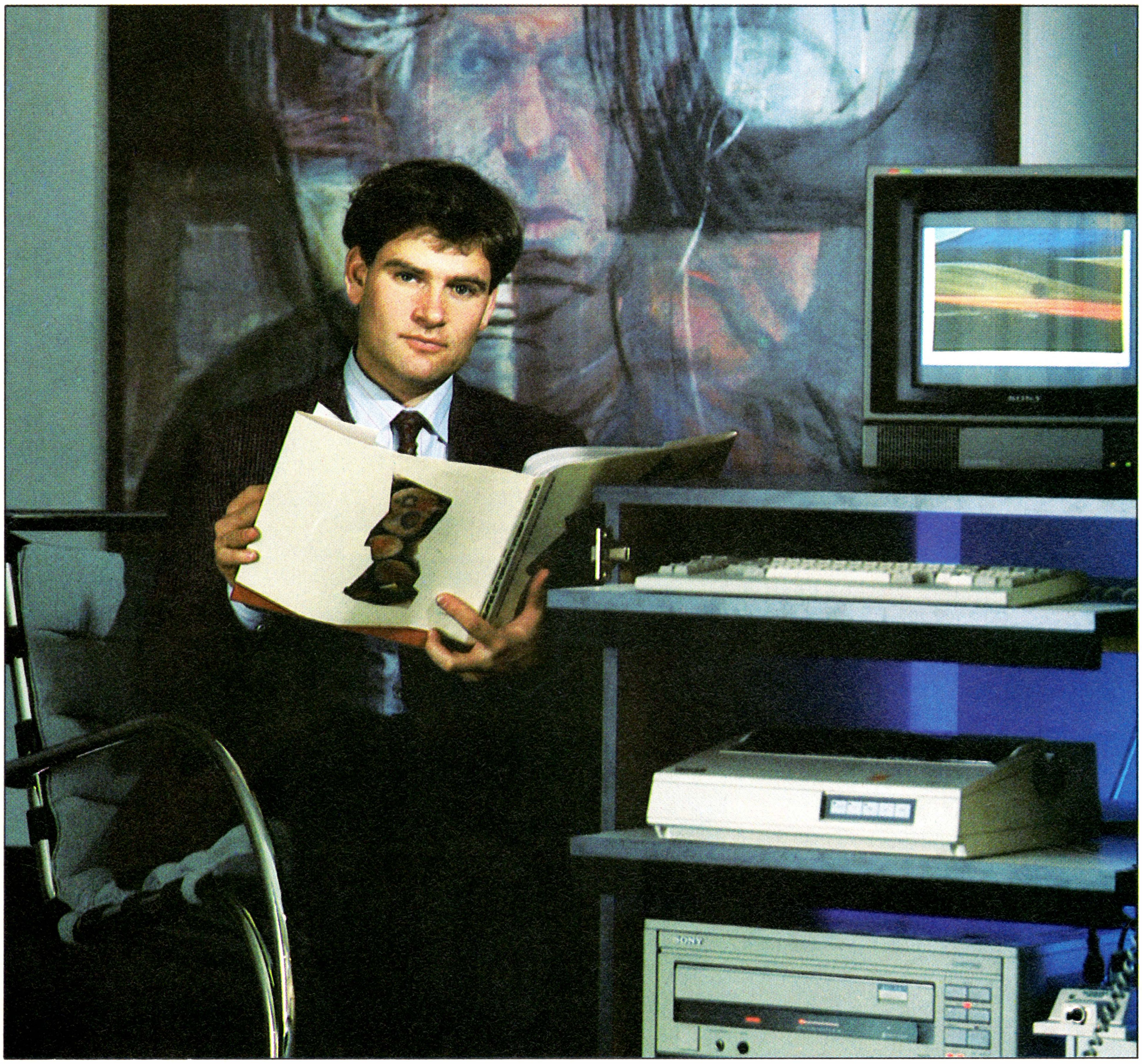

PETER TENZER/WHEELER PICTURES

The convergence of personal computer, video disk, and communications technologies enables Daniel Elias of the Barbara Krakow Gallery in Boston, Mass., to perform on-line searches for elusive artwork using the Omnivex Network.

Clever, And It's Art

Traipsing through those out-of-the-way art galleries in search of the one piece of art that is a suitable and tasteful complement to your other expensive possessions can be a protracted process hard on your eyes, feet, and wallet. Now the Omnivex system and Network from Creiger Associates provides a high-technology equivalent to letting your fingers do the walking. At present, seven galleries in major cities throughout the country are serving as host locations. They lease the $12,500 integrated Sony computer and laser disk system from Creiger Associates and then have access to nearly 2,000 art objects ranging in price from $300 to $300,000. In addition, network subscribers receive art images on laser disk each quarter.

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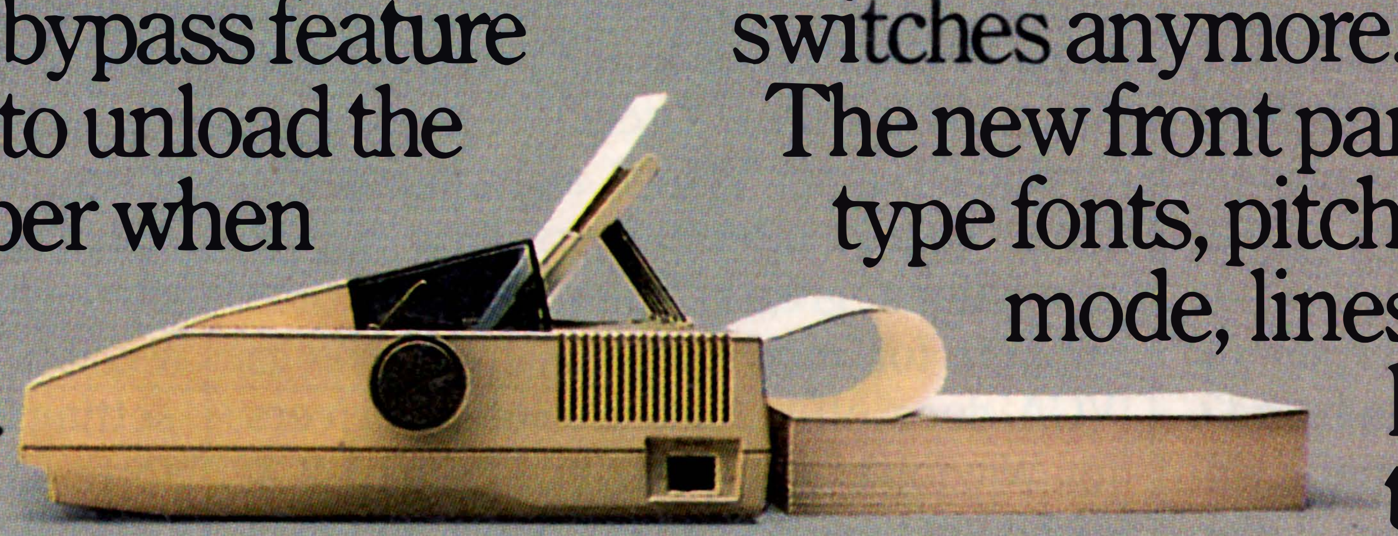

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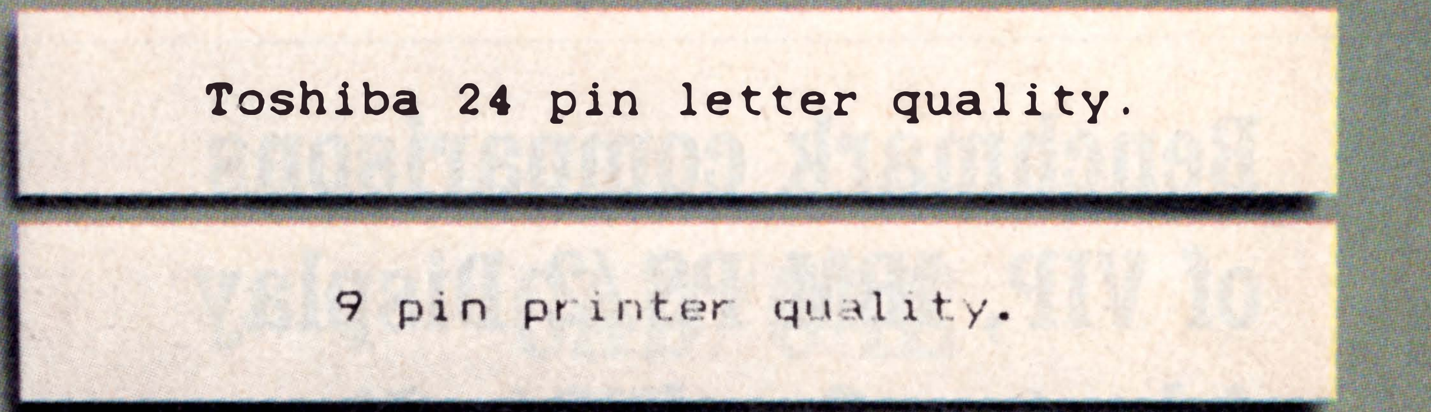

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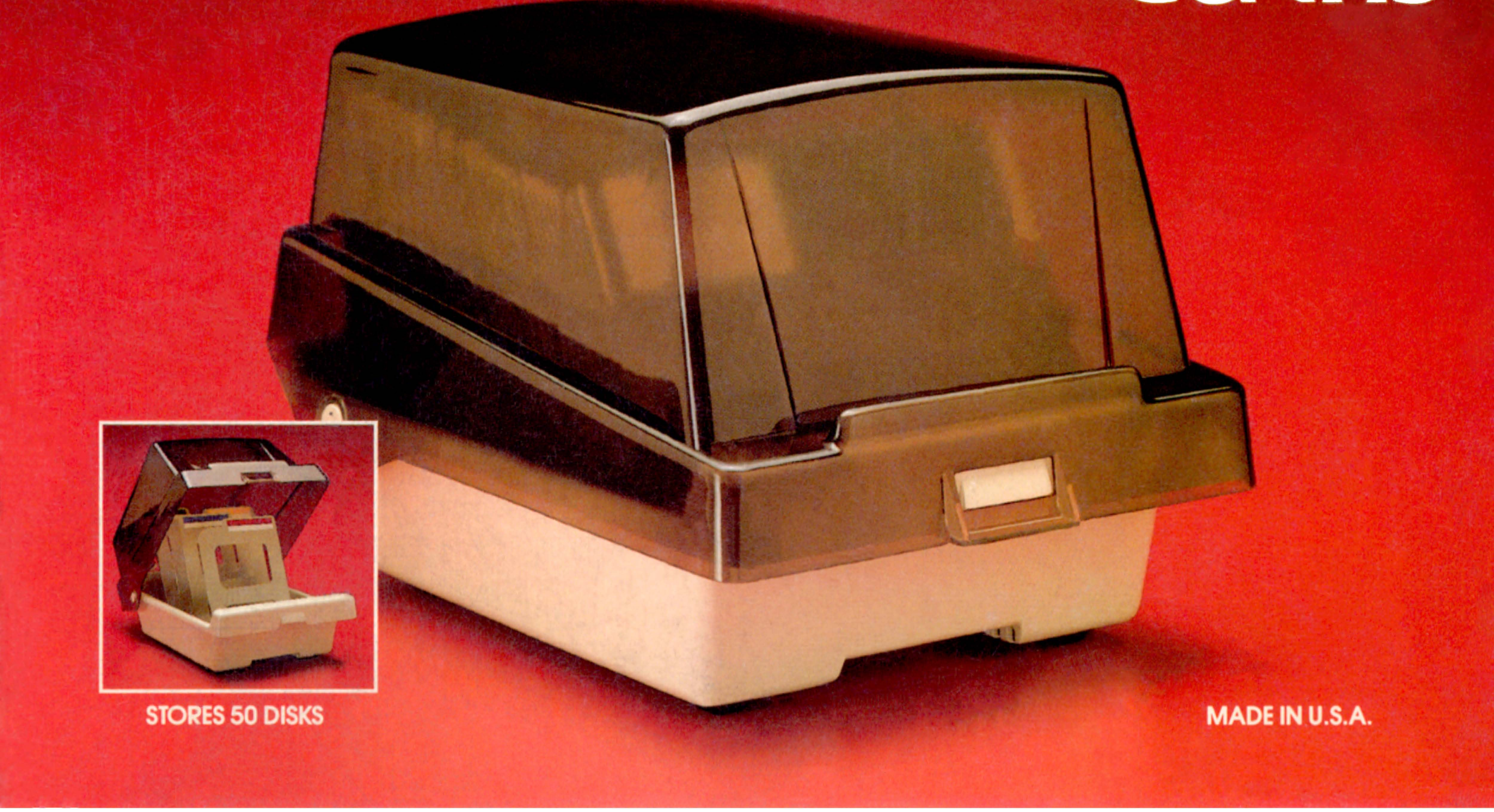

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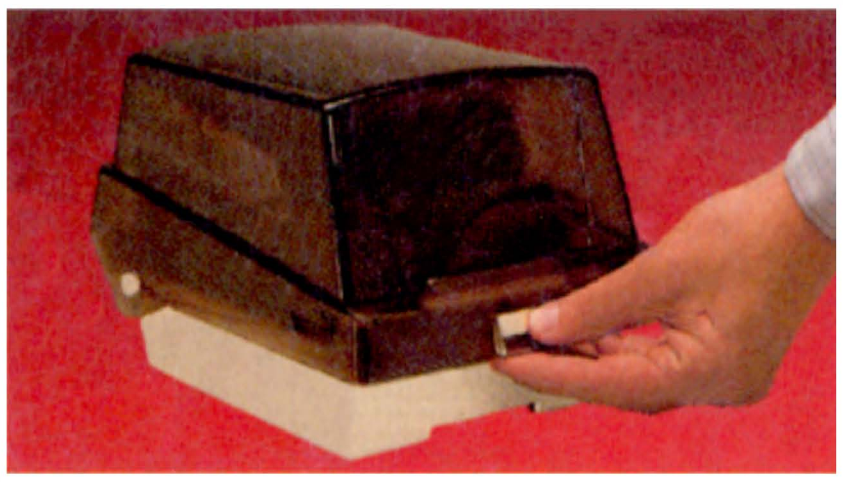

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